

**TOWARDS CO-MANAGEMENT OF SMALL-SCALE INLAND
FISHERIES AND LIVELIHOODS: A CASE STUDY OF
LAKE ITEZHI-TEZHI, ZAMBIA**

by

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Declaration

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This dissertation includes [two] original papers published in peer-reviewed journals. The development and writing of the papers (published and unpublished) were the principal responsibility of myself and, for each of the cases where this is not the case, a declaration is included in the dissertation indicating the nature and extent of the contributions of co-authors.

Date: December 2020

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With regard to [Chapter Four - Small-Scale Fishing: Income, Vulnerability and Livelihood Strategies at Lake Itzhi-Tezhi, pages 66-96 of the dissertation], the nature and scope of our contribution were as follows:

- **Sydney Kapembwa (Main Author)** was involved in conceptualising and designing the research, organising and reviewing the literature, data gathering in the field, data analysis, and framing and writing the paper.
- **Alan Gardiner (Co-Author)** was involved in giving advice on the scoping of the paper, editing and reviewing the paper.
- **Jón Geir Pétursson (Co-Author)** was involved in editing and reviewing the paper.

Signature: Declaration with signature in possession of candidate and supervisor

Date: 27th July 2020

With regard to [Chapter Five - Governance Assessment and Small-Scale Fishing in a Lake Fishery, pages 97-126 of the dissertation], the nature and scope of our contribution were as follows:

- **Sydney Kapembwa (Main Author)** was involved in conceptualising and designing the research, organising and reviewing the literature, data gathering in the field, data analysis, and framing and writing the paper.
- **Alan Gardiner (Co-Author)** was involved in giving advice on the scoping of the paper, editing and reviewing the paper.
- **Jón Geir Pétursson (Co-Author)** was involved in editing and reviewing the paper.

Signature: Declaration with signature in possession of candidate and supervisor

Date: 27th July 2020

Abstract

Over the past thirty years fisheries co-management has been the alternative governance approach for addressing fisheries resource over-exploitation in many of Africa's inland water bodies. In most cases these water bodies were previously governed by a top-down, central government-controlled governance system. Despite such a paradigm shift, most of these co-management reforms have still not proven to be a solution for governance problems in Africa's inland fisheries sector. Instead, they have produced mixed results depending on the different strategies and approaches taken by different countries. This study aimed at contributing to practical knowledge and understanding of factors that would enhance the feasibility and success of a co-management governance approach for small-scale inland fisheries, particularly in national parks and game management areas. The focus was on promoting sustainable fishing of fisheries resources and enhancing the livelihoods of fishers' households in these fisheries.

The study focused on achieving three objectives. The first was to assess the contribution of small-scale fishing on Lake Itzhi-Tezhi to the livelihoods of local fishers' households, the extent of their vulnerability, the livelihood coping strategies employed, and the impact of legislation on these livelihoods. The second was to assess and analyse the current governance approach at the small-scale Lake Itzhi-Tezhi fishery and the sustainability of fishing practices adopted by the fishers, and the third objective was to explore the prospects of initiating a co-management approach with multiple stakeholders at Lake Itzhi-Tezhi fishery.

Based on a pragmatic approach, this study used an embedded case study, with Lake Itzhi-Tezhi, Zambia as the case, as a research design. This design adopted the use of a mixed-method approach comprising focus group discussions, survey and semi-structured interviews, for collecting data from different fishery's stakeholders, primarily the fishers.

The key research finding was that there is a need for a holistic assessment of the livelihood needs of small-scale fishers before any co-management strategy is implemented. This finding implies that fishers' livelihoods should be well understood and prioritised in the planning process of a small-scale fisheries co-management arrangement. This approach would ensure

the fishers' livelihoods are supported and catered for during the development of a co-management system. Having the fishers' livelihoods supported would further motivate their continued participation in the decision-making process of the co-management arrangement, thus enhancing stewardship of every stage of the process by the fishers. Furthermore, this study argued that there is a need to assess and fully understand the existing governance system of a fishery before designing and implementing a co-management arrangement. This assessment and understanding, in terms of the governance legitimacy among stakeholders, ascertains the stakeholders' capabilities and capacities for a reformed governance approach, namely the co-management arrangement in the case of Lake Itzhi-Tezhi fishery.

Unlike the post-assessment of co-management used in other studies, this study has argued for a 'pre-assessment of co-management' with 'key conditions' for the success of the fishery co-management process. The outcome of the assessment ultimately creates a platform and framework for stakeholders, the Fisheries Co-management Development Framework in the case of Lake Itzhi-Tezhi fishery, for further deliberations towards addressing the highlighted 'key conditions'. These deliberations ultimately lead to policy creation or reforms, and designing strategies for enhancing fishers' livelihoods and promoting sustainable fishing.

Keywords

Co-management, fisher, fisheries, governance, key conditions, Lake Itzhi-Tezhi, livelihood, small-scale fishery, stakeholders

Opsomming

Oor die afgelope dertig jaar was medebestuur van visserye die alternatiewe bestuursbenadering vir die aanspreek van oorbenutting van visseryhulpbronne in talle van die binnelandse waterliggame in Afrika. In die meeste gevalle is hierdie waterliggame voorheen beheer deur 'n hiërargiese (van bo na onder), sentrale regering-beheerde bestuurstelsel. Ondanks so 'n paradigmaskuif, het die meeste van hierdie hervormings met medebestuur nog steeds nie 'n oplossing vir bestuursprobleme in die binnelandse visserye-sektor gebied nie. In plaas daarvan het hulle gemengde resultate opgelewer, afhangende van die verskillende strategieë en benaderings wat deur verskillende lande toegepas is. Hierdie studie se doel is om by te dra tot praktiese kennis en begrip van faktore wat die sukses van 'n medebestuur bestuursbenadering vir kleinskaalse binnelandse visserye sal bevorder, veral in nasionale parke en wildbestuursgebiede. Die fokus is op die bevordering van volhoubare vangste van visbronne en op die verbetering van die lewensgehalte van vissershuishoudings binne die vissersgemeenskappe.

Dié studie fokus op die bereiking van drie doelstellings. Die eerste was om die bydrae van kleinskaalse hengel aan die Itezhi-meer van Tezhi tot die lewensgehalte van plaaslike vissers se huishoudings, die omvang van hulle kwesbaarheid, die strategieë wat toegepas is vir die voortbestaan van lewensgehalte en die impak van wetgewing op hierdie lewensgehalte, te beoordeel. Die tweede was om die huidige bestuursbenadering by die kleinskaalse Itezhi-Tezhi-vissery en die volhoubaarheid van die visvangspraktyke wat deur die vissers toegepas is, te beoordeel en te ontleed, en die derde doelstelling was om die vooruitsigte te ondersoek van die instel van 'n medebestuursbenadering met veelvuldige belanghebbendes by die vissery in Itezhi-Tezhi-meer, te ondersoek.

Met 'n pragmatiese wêreldbeskouing as onderbou, het hierdie studie 'n geankerde gevallestudie gebruik, met Itezhi-Tezhi-meer in Zambië as navorsingsontwerp. Hierdie ontwerp het die gebruik van 'n gemengde metode-benadering ingespan wat fokusgroepbesprekings, opname- en semi-gekonstrueerde onderhoude behels het om data van verskillende vissery-belanghebbendes, veral die vissers, in te samel.

Die belangrikste navorsingsbevinding was dat daar 'n holistiese evaluering van die lewensbehoefte van kleinskaalse vissers nodig is voordat enige medebestuurstrategie geïmplementeer word. Hierdie bevinding impliseer dat die lewensbestaan van vissers goed begryp en geprioritiseer moet word in die beplanningsproses van 'n kleinskaalse

medebestuursreëling vir visserye. Hierdie benadering sal verseker dat die vissers se lewensbestaan ondersteun word en juis daarvoor voorsiening gemaak word met die ontwikkeling van 'n medebestuurstelsel. Indien die vissers se lewensbestaan ondersteun word, sal dit hulle voortgesette deelname aan die besluitnemingsproses van die medebestuursreëling verder motiveer, en sodoende die bestuur van elke fase van die proses deur die vissers verbeter. Voorts het hierdie studie aangevoer dat daar 'n behoefte is om die bestaande bestuurstelsel van 'n vissery te beoordeel en dit ten volle te begryp voordat 'n medebestuursreëling ontwerp en geïmplementeer word. Hierdie beoordeling en begrip, in terme van die legitimiteit van die bestuur onder belanghebbendes, bepaal die vermoëns en kapasiteit van die belanghebbendes vir 'n hervormde benadering tot bestuur, naamlik die medebestuursreëling in die geval van die Itezhi-Tezhi-meer-vissery.

Anders as die na-assessering van medebestuur, wat in ander studies gebruik is, is daar in hierdie studie voorbrand gemaak vir 'n 'voorafassessering van medebestuur' met 'sleutelvoorwaardes' vir die sukses van die vissery se medebestuurproses. Die resultaat van die assessering skep uiteindelik 'n platform en raamwerk vir die belanghebbendes – dit is die Visserye Medebestuursraamwerk in die geval van die Itezhi-Tezhi-vissery – vir voortgesette beraadslaging om die uitgeligte 'sleuteltoestande' aan te spreek. Dié beraadslaging lei uiteindelik tot die formulering van beleid of skep van hervormings, en die ontwerp van strategieë om die vissers se lewensgehalte te verbeter en volhoubare visvang te bevorder.

Sleutelwoorde

Medebestuur, visser, visserye, bestuur, sleutelvoorwaardes, Itezhi-Tezhi-meer, lewensbestaan, kleinskaalse vissery, belanghebbendes

Dedication

I dedicate this mammoth work to my dearest wife, Anna Mbinji M. Kapembwa, who had to sacrifice her precious time just to permit me to complete this piece of work. Dear, I greatly appreciate your sacrifice and the spiritual, academic, and moral support that you rendered. All this was not and will never be in vain. Special thanks also go to my two lovely boys, Epaphras and Enoch, who equally sacrificed much of the last five years without daddy by their side because of the demands of the project. Thanks a million, boys, for being patient with me. It was worth it.

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Acronyms/Abbreviations

ACF	-	Agricultural Consultative Forum
BMJ	-	British Medical Journal
BMU	-	Beach Management Unit
CAQDAS	-	Computer-Aided Qualitative Data Analysis Software
CBFM	-	Community-based Forestry Management
CGIAR	-	Consultative Group on International Agricultural Research
CPR	-	Common-Pool Resource
CRB	-	Community Resource Board
DFID	-	Department for International Development
DICT	-	Directorate of Information and Communication Technology
DoF	-	Department of Fisheries
DWNP	-	Department of Wildlife and National Parks
FAO	-	Food and Agriculture Organisation
FCC	-	Fishing Camp Committee
FCDF	-	Fisheries Co-management Development Framework
FGD	-	Focus Group Discussion
FSRP	-	Food Security Research Project
FTTA	-	Fishermen and Fish Traders Association
FMC	-	Fisheries Management Committee
FVC	-	Fishing Village Committee
GEF	-	Global Environmental Finance
GMA	-	Game Management Areas
HREC	-	Humanities Research Ethics Committee
IAPRI	-	Indaba Agricultural Policy Research Institute
IASCP	-	International Association for the Study of Common Property
ICLARM	-	International Centre for Living Aquatic Resources Management
IAD	-	Institutional Analysis and Development
IDS	-	Institute of Development Studies
IFSTCU	-	Inland Fisheries Sector Technical Co-ordinating Unit

IIFET	-	International Institute of Fisheries Economics and Trade
IOM	-	International Organisation for Migration
IUCN	-	International Union for Conservation of Nature
KCA	-	Key Conditions Approach
KNP	-	Kafue National Park
ML	-	Maximum Likelihood
MoU	-	Memorandum of Understanding
MPRA	-	Munich Personal RePEc Archive
NAP	-	National Agriculture Policy
NORAD	-	Norwegian Agency for Development Cooperation
NORHED	-	Norwegian Programme for Capacity Development in Higher Education and Research for Development
ODI	-	Overseas Development Institute
ODK	-	Open Data Kit
PMRC	-	Policy Monitoring and Research Centre
REMNPAS	-	Reclassification and Effective Management of the National Protected Areas System
SADC	-	Southern Africa Development Community
SARNISSA	-	Sustainable Aquaculture Research Networks in Sub-Saharan Africa
SDG	-	Sustainable Development Goal
SLA	-	Sustainable Livelihood Approach
SLF	-	Sustainable Livelihood Framework
SPSS	-	Statistical Package for Social Sciences
TD	-	Transdisciplinarity
UNDP	-	United Nations Development Programmes
UK	-	United Kingdom
USAID	-	United States Agency for International Development
VAG	-	Village Action Group
ZESCO	-	Zambia Electricity Supply Corporation
ZDA	-	Zambia Development Agency

List of Publications

1. **Kapembwa S.**, Gardiner A., and Pétursson J.G. (2020). Small-scale fishing: income, vulnerability and livelihood strategies at Lake Itzhi-Tezhi, Zambia. *Development Southern Africa*
<https://doi.org/10.1080/0376835X.2020.1746636> (Online publication)
2. **Kapembwa S.**, Gardiner A., and Pétursson J.G. (2020). Governance assessment of small-scale inland fishing: the case of Lake Itzhi-Tezhi fishery, Zambia. *Natural Resources Forum*, 44(3), 236–254

Chapter 1.

General Introduction

1.1. Background

In many parts of Africa communities living near perennial streams, swamps, rivers and lakes rely on small-scale fishing¹ as an essential part of their livelihood (Food and Agriculture Organisation, 2016; Lynch et al., 2017). The small-scale inland fisheries sector has proven to play an essential role in local livelihoods mainly through the provision of food, income and employment to many African people (Food and Agriculture Organisation, 2016; Weeratunge et al., 2014; Welcomme et al., 2010). Governance of the small-scale fisheries sector has taken centre stage in government policy and legislation owing to the sector's significance (Food and Agriculture Organisation, 2015).

Graham, Amos, and Plumptre (2003:2) defined governance as “the interactions among structures, processes and traditions that determine how power and responsibilities are exercised, how decisions are taken, and how citizens have their say”. Governance of the small-scale fisheries, inland fisheries in general, has had to deal with their being common-pool resources. Therefore, to reduce the adverse effects of a common-pool arrangement of small-scale inland fisheries in African countries, various governance approaches have been employed over the years, such as a central government-controlled system, a decentralised government system, a customary system, a community-based system, co-management and market-type approaches (Nunan, Menton, McDermott, Schreckenberg, & Huxham, 2018; Sen & Nielsen, 1996). Despite these approaches, over-exploitation of fisheries resources in several African inland fisheries has continued (Ogutu-Ohwayo & Balirwa, 2006). This over-exploitation is mainly a consequence of the following factors: low participation in governance from the local fishing communities, limited extension services, inappropriate fisheries laws and regulations, inadequate enforcement of existing laws and regulations, weak

¹ Small-scale fishing (artisanal or traditional or subsistence fishing) involves low-technology, low-capital, fishing practices undertaken by individual fishing households in lakes, rivers, streams, wetlands and reservoirs as opposed to the practices of commercial companies (Food and Agriculture Organisation, 2009).

institutions and institutional processes, and insufficient funds for implementing fisheries programmes (Ogello, Obiero, & Muguti, 2013; Ogutu-Ohwayo & Balirwa, 2006). Hence there is still a need for organisational structures, operational conditions, socio-economic analysis, legislation, social relations, and stable co-management arrangements and structures that are country- and fishery-specific in order to strengthen governance, enhance small-scale fishers' livelihoods and promote sustainable fishing (Isaacs, 2012; Spelchan, Nicoll, & Hao, 2011; Stobutzki, Silvestre, & Garces, 2006). This need seems to be the current scenario in the Zambian small-scale inland fisheries, hence my conducting this study at Lake Itzhi-tezhi small-scale fishery.

This study focuses on highlighting practical knowledge and understanding of factors that would contribute to the feasibility and success of a co-management governance approach for small-scale inland fisheries, particularly in national parks and game management areas. This approach is aimed at supporting sustainable fishing for the purpose of boosting fish stocks and enhancing the livelihoods of fishers' households in fishing communities.

1.2. Governance of the inland fisheries in Africa

Governance reforms were needed because a more traditional, top-down central government-controlled governance system has failed in a number of African countries in addressing, mostly, the issue of over-exploitation of fisheries (Simasiku, Simwanza, Tembo, Bandyopadhyay & Pavy, 2008; Wilson, et al., 2010; Evans, Cherrett & Pems, 2011; Lawrence, 2015). One of the most critical governance reforms on inland fisheries in Africa has involved fisheries co-management programmes (Lawrence, 2015; Nielsen et al., 2004; Nunan, Hara, & Onyango, 2015). Pomeroy and Berkes (1997:466) define fisheries co-management as “the sharing of responsibility and authority between the government and the community of local fisheries to manage a fishery” and they add that “it covers various partnership arrangements and degrees of power-sharing and integration of local and centralised management systems.” Fisheries co-management involves collaboration among several stakeholders (Carlsson & Berkes, 2005). To achieve co-management, on the part of government, the most important incentives to cooperate with the resource users have been its inability to address reduced levels of compliance with regulations among fishers, the high

costs of resource monitoring, low capacity in enforcing laws and regulations, avoidance of conflicts among resource users, and fisheries resource depletion (Svendrup-Jensen & Nielsen, 1998; Wilson et al., 2010). On the part of resources users, it has been the presence of conflict between small-scale and commercial fishers, lack of access rights to fisheries resources, poor livelihoods among fishers' households, conflict among small-scale fishers themselves, conflict between fisheries and other stakeholders, and lack of representation in decision making with regard to fisheries management and benefit-sharing (Svendrup-Jensen & Nielsen, 1998).

Since the 1990s co-management has been viewed as an alternative and appropriate governance strategy in some African countries to address such issues (Svendrup-Jensen & Nielsen, 1998; Wilson et al., 2010; Lewins et al., 2014). However, as much as co-management has been successful in replacing the central government governance system, most co-management programmes between African governments and fishers have involved the exchange of minimal information, and little or no decentralisation of power and authority to fishers by the governments (De Koning, 2009; Nielsen et al., 2004; Njaya, 2007b; Sen & Nielsen, 1996). As a result, this has mostly led to a failure to achieve their intended objectives, mainly to prevent over-exploitation of fisheries resources, in several inland fisheries (Food and Agriculture Organisation, 2015; Haambiya, Kaunda, Likongwe, Kambewa, & Muyangali, 2015; Kosamu, 2017; Ogello et al., 2013; Welcomme et al., 2010). For co-management to be effective, it ideally demands an environment that gives authority and power to both resource users and government, and makes clear the roles of specific stakeholders (Njaya, 2007b). Developing and implementing such as a governance approach also requires that it is country- and fishery-specific as it cannot work the same way in all the countries and fisheries.

1.3. Fisheries governance reforms in Zambia and their challenges

From the British colonial era management of fisheries in Zambia has primarily been carried out by the central government through implementing specific measures. These measures included closed fishing seasons, closed breeding areas, the prohibition of particular methods and gear, restrictions on mesh sizes, and limiting the number of fishers in any given fishery

through the issuance of fishing licences (ACF/FSRP, 2009; Government of Zambia, 2015a; Malasha, 2002). However, as in many other African countries, this governance and management approach has not been successful in preventing over-exploitation of resources in almost all the fisheries (Department of Fisheries, 2015).

Donor-driven co-management reforms were piloted in the 1990s in four major fisheries, namely Lake Mweru, Lake Bangweulu, Lake Tanganyika and Lake Kariba, upon realising the ineffectiveness of the centralised government system in the governance and management of the fisheries (West, 2001; Malasha, 2007a). The primary focus of the reforms was to involve the local community in mitigating the flow of immigrant fishers into the fishery areas, the use of illegal fishing methods and gear, non-adherence to fishing regulations, and fishing in breeding areas (Malasha, 2007a). These measures were ultimately intended to prevent over-exploitation.

Nevertheless, the reforms were faced with several challenges during the implementation process such as:

- (i) the absence of a legal framework through which co-management could be implemented;
- (ii) some competing and conflicting layers of governance among different authorities, such as Department of Fisheries (DoF), traditional and local authorities, in the implementation process. Although the DoF had a legal mandate to spearhead the governance process, the traditional and local authorities also had some legitimate claims in one way or another on these fisheries;
- (iii) the institution mandated to spearhead the co-management process was quite weak as it had no capacity in terms of financial and human resources to implement and monitor progress in those targeted fisheries;
- (iv) the lack of full recognition of the contribution of the fishing communities in the design, implementation and monitoring of the initiative; it was more of a top-down kind of design;
- (v) no incentives were forthcoming, especially to benefit the local fishing community, hence there was no motivation to participate and make the co-management fully sustainable; and

- (vi) the co-management arrangements were donor-driven; thus the pulling out of the donor agencies from supporting the co-management arrangements contributed to their being unsustainable (Haambiya, Kaunda, Likongwe, Kambewa, & Chama, 2016; Haambiya et al., 2015; Malasha, 2007a; Mudenda, 1999).

1.4. Contribution of fishing to livelihoods and Zambia's economy

The fisheries sector is a key component of the Zambian economy as it supports more than 25 000 small-scale fishers and 30 000 fish processors and fish traders, all estimated to derive their livelihood directly from fishing (Policy Monitoring and Research Centre, 2015). The other areas that provide employment associated with the fisheries sector are boat building and repair, net manufacturing, and transportation. For instance, Sonjiwe et al. (2015) revealed that 94% of rural fishing community in Chanyanya fishing camp in Kafue district, Zambia, derived their livelihood from fishing and other fishing-related activities. Income generated was used to build houses, buy fishing equipment and household needs, and pay for their children's school fees and health care; hence these, in turn, contributed to their improved livelihood and food security.

Nutritionally, fish and fish products account for about 40 percent of animal protein intake and provide essential micronutrients to the majority of Zambia's population who are highly vulnerable to malnutrition (Kefi & Mofya-Mukuka, 2014; Musumali et al., 2009). Furthermore, most of Zambia's water bodies are accessible to most of the rural population, and thus fish remains an important source of food as well as source of high nutritional value.

The economic and nutritional value of fish has led to a general demand for fish in the country. Total annual fisheries production – 90% from the capture or natural fisheries and 10% from aquaculture production – is estimated at 80,000 tonnes (Department of Fisheries, 2015). This is an important increase from the 50,000 tonnes/annum in 1980 (Department of Fisheries, 2015; Mudenda, 1999). As of 2015, the fisheries sector accounted for 1% of the total Gross Domestic Product of Zambia (Policy Monitoring and Research Centre, 2015). This indicates that the sector has the potential to contribute to the country's economic development.

However, there has been a decrease in per capita consumption from 12 kg in the 1970s to 7.7 kg in 2012 (Kefi & Mofya-Mukuka, 2015). This drop has been attributed to the decline in fish catches in some fisheries as a result of excessive fishing and the use of unsustainable methods of capturing fish (Kefi & Mofya-Mukuka, 2015). There has also been an increase in fish demand as a result of a rise in the country's population, from 13 million in 2010 to 15 million in 2015 representing an increase of 18.3% (Central Statistics Office, 2016; Department of Fisheries, 2015; Kefi & Mofya-Mukuka, 2015). The nation's demand for fish has been estimated at 120 000 tonnes per year against the fish supply of 80 000 tonnes per year from capture fisheries and aquaculture (Department of Fisheries, 2015; Kefi & Mofya-Mukuka, 2015). However, the country still has the potential to produce more fish on a sustainable basis through the employment of an appropriate governance strategy in the capture fishery areas and the promotion of aquaculture through cage culture (reservoirs and lakes) and pond culture systems. This study looks at the governance strategy in the capture fishery area in relation to the livelihoods of the small-scale fishers. There is still a limitation of information on the specifics of the livelihoods of small-scale fishers in Zambia.

1.5. Zambia's fisheries legislation and policy

The regulatory framework for the management of fish resources goes back as far as the Fish Conservation Ordinance of 1925 and was closely linked to the country's game laws (Table 1.1). During this period traditional authorities also had some control over the illegal use of fishing methods and gear, and this led to a reduction in fish harvested from water bodies (Government of Zambia, 2007). The fisheries sector's link to game laws changed in 1943, when the Fish Control Regulations Act (Mweru-Luapula Fisheries Area) was put in place (Table 1.1). This Act was then changed to Fish Conservation Ordinance of 1962 (Mudenda, 2009). Additional changes also occurred in 1974 (Table 1.1) when all the different regulations mentioned above were combined to create the Fisheries Act (200 of 1974) (Government of Zambia, 2010b). From 1974, fish resources were managed under the guidelines of this Fisheries Act (200 of 1974) (Government of Zambia, 2010b), which vested all rights and responsibilities for fisheries resources in the President of the Republic and withdrew all traditional operating systems. It also did not include any form of local

community participation in the governance, management and conservation of the fisheries resources.

It was not until the amendment and enactment of the Fisheries Act (22 of 2011) (Government of Zambia, 2011) that pieces of legislation were included to address issues that pertain to the participation of local fishing communities through the formation of the Fisheries Management Committees (FMC) (Table 1.1). Almost half of the FMC's total membership would be drawn from the local fishing community, and the others would be stakeholders from around the fishery. In consultation with the government, the FMC was mandated to design and implement the fishery management plans for a given fishery.

Until the early 1980s fisheries conservation and management were based on regulation practices similar to those applied to the wildlife sector, being one of the natural resources (Table 1.1). This scenario could have contributed to the emergence of a few protected fish breeding sites in Lake Mweru, Luapula province. However, the transfer of the conservation and management roles of the fisheries sector from the Ministry of Natural Resources to the Ministry of Agriculture in 1982 reflected a significant change in policy (Table 1.1). The fisheries sector was now viewed and managed as a food-production system and revenue-generating venture, slowly relegating fisheries conservation activities to the background (Government of Zambia, 2010a). In 2011 the sector was again transferred to the newly created Ministry of Livestock and Fisheries Development, which in 2015 was changed to Ministry of Fisheries and Livestock, to strengthen its mandate in national fisheries and aquaculture development (Table 1.1).

Despite these transfers, the fisheries sector still functioned without a national fisheries policy (NFP), which would have given it specific fisheries-related guidelines on the participation criteria of small-scale fishers in governance, roles of stakeholders in fisheries governance and management, modalities on sustainable fishing, and enhancement of the livelihood of fishers' households (Kefi & Mofya-Mukuka, 2015). However, in the absence of the NFP, the Department of Fisheries (DoF) adopted a National Agricultural Policy (NAP) (2012–2030) which largely governed the development of the agriculture sector in Zambia (Table 1.1). This policy framework was adopted because it highlighted a critical component, among other

fisheries aspects, namely the decentralisation of management of capture fisheries by devolving more power to local communities for sustainable fishing.

Table 1.1: Timeline for fisheries legislation and policy changes

Time frame	Changes in legislation and policy	Focus
1925	Fish Ordinance	<ul style="list-style-type: none"> • Fisheries management and conservation • Control of fish harvesting by traditional authorities
1943	Fish Control Regulation Act	<ul style="list-style-type: none"> • Fisheries management and conservation • Commercial fishing regulation
1962	Fish Conservation Ordinance	<ul style="list-style-type: none"> • Fisheries management and conservation • Commercial fishing regulation
1974	Fisheries Act of 1974	<ul style="list-style-type: none"> • Regulation of commercial fisheries • Protection of areas vital for fish breeding • Regulation of methods of fishing • Registration and payment of licenses • Registration of fishermen and boats used in fishing • Racial and discriminatory phases removed
1982	Transfer of fisheries sector from the Ministry of Natural Resources to the Ministry of Agriculture	<ul style="list-style-type: none"> • Fish production and revenue generation
2007	Fisheries Act of 1974 amendment bill	<ul style="list-style-type: none"> • Local fishing community participation in fisheries governance and management • Conservation of aquatic habitat and fauna • Promotion of aquaculture development
2011	Fisheries Act of 2011 enacted	<ul style="list-style-type: none"> • Participation of local fishing communities through the establishment and operation of Fisheries Management Committees (FMC) • Formulation and implementation of Fisheries Management Plans • Aquaculture development • Establishment of Aquaculture and Fisheries Development Fund
2011	Transfer of fisheries sector from the Ministry of Agriculture to the Ministry of Livestock and Fisheries Management	<ul style="list-style-type: none"> • Fisheries conservation and management • Local community participation in governance and management • Aquaculture development
2012	National Agricultural Policy (NAP)	<ul style="list-style-type: none"> • Decentralisation of capture fisheries management to local communities • Promotion of sustainable fishing of fisheries resources

2015	Change of name to Ministry of Fisheries and Livestock	<ul style="list-style-type: none"> • Aquaculture development • Fisheries conservation and management • Local community participation in governance and management • Aquaculture development
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Sources: Chongo & Mengo, 2015; Government of Zambia, 2007; Malasha, 2007b; Mudenda, 1999; Southern Africa Development Community, 2016

1.6. Fisheries areas and other protected areas in Zambia

Seven types of publicly-managed protected areas are legally recognised in Zambia (Government of Zambia, 2010a). These include fishery areas, national parks, game management areas (GMAs), wildlife sanctuaries, forest reserves, Ramsar sites and heritage sites. Under the Fisheries Act (22 of 2011) (Government of Zambia, 2011), the fishery areas are referred to as fisheries management areas, that is, areas prescribed by the Minister of the fisheries sector for conducting legal small-scale/artisanal, recreational and commercial fishing. However, some fishery areas fall within the other aforementioned protected areas, especially National Parks and GMAs (Figure 1.1).

Game management areas are communally-owned wildlife estates where some wild animals are protected and are mainly used for consumptive and non-consumptive tourism (Simasiku et al., 2008: vi). Thirty-six GMAs (Figure 1.1) cover 22% of the country's territory (167,000 km²) (Lindsey et al., 2013; Simasiku et al., 2008). The GMAs serve as buffer zones for the national parks; human settlement is permitted, and wildlife use is focused mainly on trophy hunting (Simasiku et al. 2008). Twenty national parks (Figure 1.1) cover approximately 65,000 km², nineteen of which have such GMAs around them (Lindsey et al., 2013). Among the prescribed fisheries, parts of Lakes Itzhi-Tezhi fishery and Tanganyika fishery fall within the Kafue National Park and the Nsumbu National Park respectively (Figure 1.1). These fisheries also share borders with some GMAs. Governance of these fisheries has been different from those that do not have this kind of arrangement. More than one government department and other community institutions such as community resource boards and village action groups for the community-based natural resources management in GMAs, have been involved (Simasiku et al., 2008).

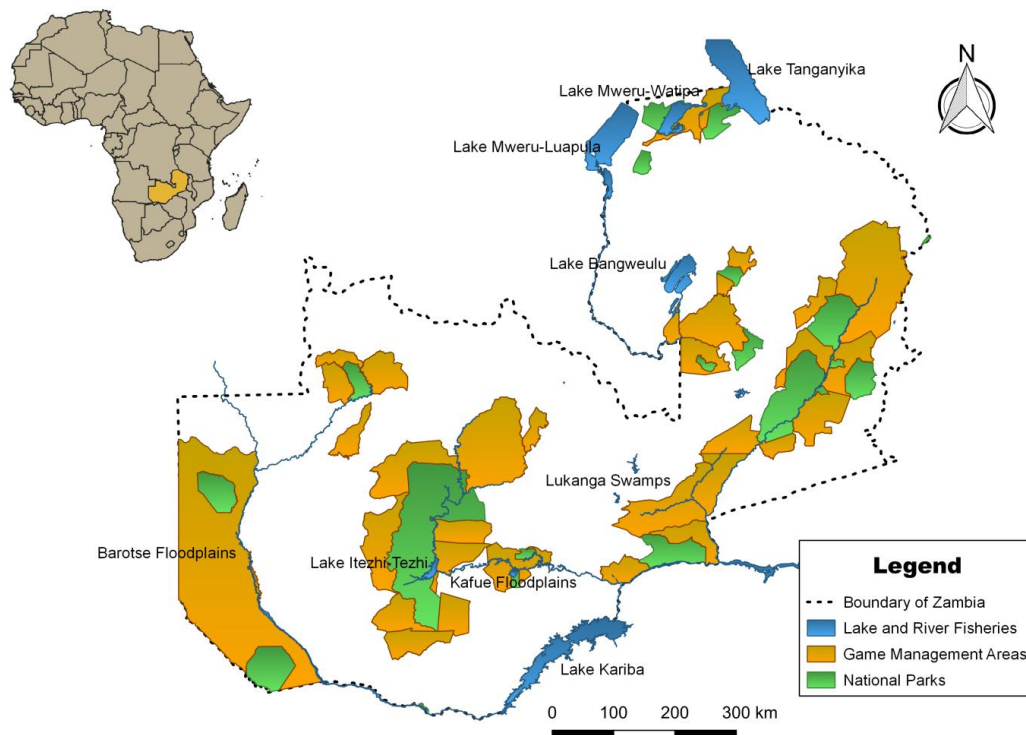


Figure 1.1: Nine major fisheries, national parks and game management areas in Zambia

Source: Author

Before the 1990s an increase in poaching in national parks led to a decline in wildlife, mainly because of a lack of local community participation. As a result, the need for new models of conservation with an integration of the local communities emerged. That led to the enactment of the Zambia Wildlife Act (12 of 1998) (Government of Zambia, 1998) to enhance the concept of community participation through community-based natural resources management in game management areas (GMAs). It was hoped this would address, across all the GMAs and national parks, poaching, fire, subsistence agriculture, illegal or unsustainable fishing, and deforestation of GMAs (Simasiku et al., 2008). However, illegal fishing was not a priority under the community-based natural resources management arrangement. As a result, there was over-exploitation of the fisheries resources in almost all the wetlands and freshwater bodies in the GMAs (Simasiku et al., 2008).

Furthermore, weakened government and traditional governance structures (Kefi & Mofya-Mukuka, 2015) resulted in fishery areas in GMAs and national parks being more 'open access'. Apart from the resulting resource over-exploitation, the fisheries in these areas also increasingly attracted conflicts amongst various resource users and interest groups.

Additionally, two government departments, the Department of National Parks and Wildlife (DNPW) and the DoF, guided by the Wildlife Act (14 of 2015) (Government of Zambia, 2015b) and the Fisheries Act (22 of 2011) (Government of Zambia, 2011) respectively, have been operating in the fisheries-endowed GMAs and national parks without policy direction on effective collaboration and collective action. The DNPW has been more concerned with wild animals, despite the presence of other natural resources such as fisheries. On the other hand, the DoF has faced challenges in managing the country's fisheries because of a lack of capacity in terms of human and financial resources. Before the enactment of the Fisheries Act (22 of 2011) (Government of Zambia, 2011), the lack of legislation to support community participation in fisheries management by DoF was also a setback in its operations (Kefi & Mofya-Mukuka, 2015; Malasha, 2007b). As a result of these factors, unsustainable use of fishing practices has remained widespread in fisheries areas, hence the over-exploitation (Haambiya et al., 2015).

It is clear that there is a need to develop a governance strategy which emanates from the local fishing communities themselves and other stakeholders in fisheries-endowed national parks and GMAs. This arrangement calls for collectively developing a governance approach that enhances a sense of strong local community ownership and responsibility of the small-scale inland fishery..

1.7. Research aim, objectives and questions

1.7.1. Research aim

The overall aim of this study is to contribute to practical knowledge and understanding of factors that would enhance the success of a co-management governance approach for small-scale inland fisheries, particularly in national parks and game management areas. The focus is on promoting sustainable fishing of fisheries resources and enhancing the livelihoods of fishers' households in these fisheries.

1.7.2. Research objectives and questions

Objective 1: To assess the contribution of small-scale fishing on Lake Itzhi-Tezhi to the livelihoods of local fishers' households, the extent of their vulnerability, the livelihood strategies employed, and the impact of legislation on these livelihoods.

Research questions

- i. What is the contribution of income from fishing to fishers' livelihood assets?
- ii. To what extent have stakeholders, fishers' vulnerability and legislation affected the fishers' livelihoods?
- iii. What are the fishers' livelihood strategies, and how have these strategies affected their livelihoods?

Objective 2: To assess and analyse the current governance approach at the small-scale Lake Itzhi-Tezhi fishery and the sustainability of fishing practices by the fishers.

Research questions

- i. How do the different stakeholders perceive the legitimacy of the current governance approach and the challenges experienced in its execution towards sustainable fishing practices?
- ii. What are the roles of the different stakeholders under the current governance approach in relation to sustainable fishing practices?
- iii. What has been the impact of legislation and policy on the governance approach and sustainable fishing practices, and how can it guide the way forward?

Objective 3: To explore the prospects of initiating a co-management approach with multiple stakeholders at Lake Itzhi-Tezhi fishery.

Research questions

- i. What are the stakeholders' perceptions on the feasibility of a co-management arrangement for Lake Itzhi-Tezhi fishery?

- ii. How would the ‘key conditions’ for successful co-management be able to address the stakeholders’ expected challenges and benefits during the implementation process?
- iii. What would be the co-management structure and roles of all stakeholders in order to ensure successful implementation of co-management?

1.8. Significance of the study

The significance of the study could be evaluated based on three major aspects: its contribution to policy, to practice and to the literature.

Firstly, the study contributes to the fisheries policy-making process for the Zambia fisheries sector. The National Fisheries Policy is not yet in place for the fisheries sector. Zambia has been using the National Agriculture Policy to direct the governance, management, and conservation of her fisheries resources. However, this policy has not adequately addressed the challenges of exploitation of the fisheries resources through unsustainable fishing practices by fishers. The need for a standalone National Fisheries Policy cannot be over-emphasised. Recommendations of the study serve as policy-relevant information to help the government, the local fishing community and other key stakeholders in the planning, designing and implementation of the fisheries policy.

Secondly, the study would be useful in supporting the government ministries and departments, local governments, local fishing communities, non-governmental organisations, traditional authorities and private firms who collaborate to ensure fisheries resources are governed and managed appropriately. The study provides an empirical case of how small-scale fishers’ livelihoods are assessed and incorporated into the governance process of fisheries resources. It also demonstrates how governance of fisheries is assessed for the purpose of improving or transforming ineffective fisheries governance in a particular fishery. It also highlights the strategy for assessing the feasibility of a fisheries co-management arrangement using a ‘bottom-up’ approach to ensure its success and to promote sustainable fishing.

Thirdly, the study contributes to the literature on small-scale fishers' livelihoods, fisheries governance, and fisheries co-management as two manuscripts have already been published in peer-reviewed journals. Chapter Four of the dissertation is a manuscript entitled "Small-scale fishing: income, vulnerability, and livelihood strategies at Lake Itzhi-Tezhi, Zambia" published in the *Development Southern Africa*, DOI: 10.1080/0376835X.2020.1746636, by Wiley. It discusses a holistic and multi-sectoral approach to addressing the livelihood needs and challenges of the fishers' households towards achieving livelihood sustainability and promoting sustainable fishing. Chapter Five is a manuscript entitled "Governance assessment and small-scale inland fishing: the case of Lake Itzhi-Tezhi, Zambia" published in the *Natural Resources Forum* 44(3), 236–254, by Taylor and Francis. It demonstrates how to assess and transform an existing fisheries governance approach at a particular lake fishery into a legitimate co-management governance approach.

Overall, the study contributes to knowledge a framework called Fisheries Co-management Development Framework (FCDF) that would help to guide the identification of critical problems at the fishery that need to be addressed through a co-management arrangement. The FCDF would also assist in identifying the key stakeholders of the fishery, especially the local fishers, who would be engaged to provide their perceptions on the livelihood status of the fishers and the governance situation of the fishery. The outcome of such engagement would help in identifying the expected challenges that need to be addressed, and the expected benefits to be realised during the co-management implementation.

1.9. Structure of the dissertation

Chapter One describes the background of the research problem. The research problem gave rise to the research aim and objectives with their related research questions. The chapter outlines the scope of the study and provides a brief overview of the dissertation structure, thus creating a guide to the dissertation itself. Figure 1.2 shows a schematic structure of how the chapters of this dissertation relate and link to each other.

Chapter Two provides the conceptual framework that indicates the theories and concepts that shape the study. It links the concepts to provide an understanding of content, the direction and the end product of the study.

Chapter Three outlines the research paradigm, the methodology, the research design, sampling and data-collection methods, data-analysis approaches, ethical issues which pertain to the study, and a description of the study context and area. This chapter also highlights the fact that additional information is presented in the methodology section of each empirical paper (Chapters Four to Six) as they are also stand-alone papers.

This study adopted a paper-based approach in that each chapter took the form of a peer-reviewed publishable paper as a way of disseminating knowledge in the field of fisheries co-management. Chapters Four to Six are structured as follows: introduction, brief background/literature review or theoretical framework, methodology, results, discussion, conclusion and references.

Chapter Four focuses on assessing the actual impact of the fishing income on the livelihood assets of fishers' households, the livelihood strategies they employed to mitigate their exposure to vulnerability, the extent of the contribution from other stakeholders towards their livelihoods, and the way forward in improving their livelihoods. It also endeavours to analyse the impact of legislation and policy on their livelihoods and the way forward to improve their livelihoods. The issues in this chapter were addressed by objective one and its related research questions. This chapter has been published as "Small-scale fishing: income, vulnerability and livelihood strategies at Lake Itzhi-Tezhi, Zambia".

Chapter Five assesses the extent to which the fishing community had been involved in the governance of the fisheries resources in Lake Itzhi-Tezhi. The study assesses the legitimacy of the governance approach adopted among stakeholders. It also analyses the impact of national legislation and policy on the existing governance approach and on promoting sustainable fishing of fisheries resources. It gives the basis on which to investigate the feasibility of designing a governance strategy and structure which would incorporate the fishing community and other stakeholders (Figure 1.2 and Chapter Six). This study was conducted based on objective two and its related research questions. This chapter is published

as “Governance assessment of small-scale inland fishing: the case of Lake Itzhi-Tezhi, Zambia”.

Chapter Six explores the feasibility of a co-management governance strategy that would help to mitigate over-exploitation of the fisheries resources in Lake Itzhi-Tezhi and enhance livelihoods among fishers’ households. The study takes a bottom-up approach by engaging different stakeholders around the fishery to reflect their perceptions on the matter. It shows how to diagnose the feasibility, success and sustainability of a co-management strategy based on eleven key principles and conditions. The study further looks at the roles stakeholders would play in the proposed governance strategy, the challenges they would anticipate in the implementation phase, the benefits they would derive through implementation of the strategy, a proposed structure for the governance strategy, and an analysis on the role of legislation and policy in the whole governance process. The study was conducted based on objective three and its related research questions. This chapter incorporates governance issues highlighted in Chapter Five as they are critical to the success and sustainability of the fishery co-management in the long term.

Chapter Seven presents a general overview of the whole dissertation and draws essential conclusions from Chapters Four, Five and Six based on the conceptual framework. The chapter also highlights relevant insights and recommendations for policy reforms in relation to the development of a co-management governance approach for small-scale fisheries of Zambia, and Africa at large. In the end, the chapter brings out some relevant further research areas that would supplement the findings of this study.

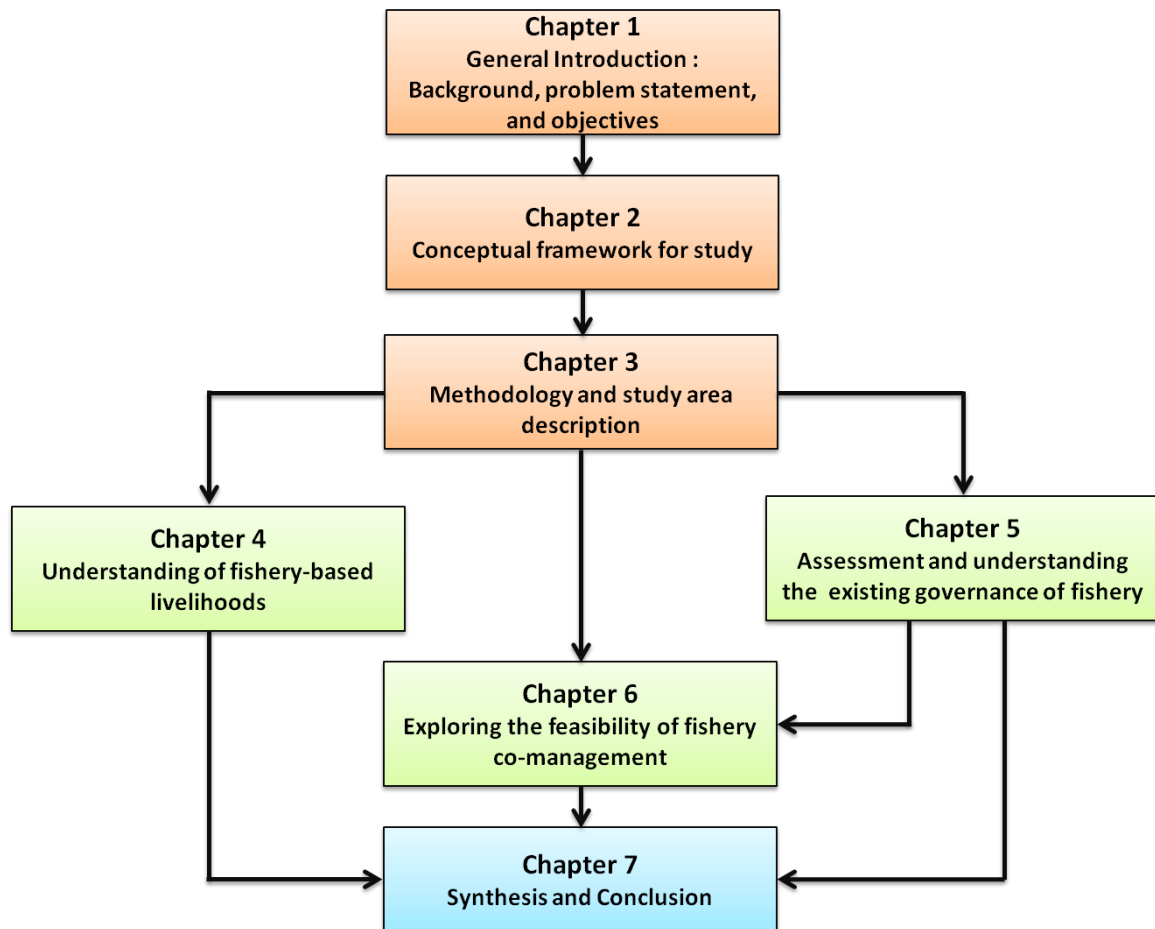


Figure 1.2: Schematic structure of the dissertation

1.10. Chapter summary

This chapter has presented a general overview of governance reforms of Africa's inland fisheries, particularly Zambia's fisheries. It has presented how co-management became the alternative governance system of Africa's inland fisheries from the traditional top-down, central government-controlled governance system and the challenges encountered in the implementation process. The chapter delved into the evolution of fisheries governance in Zambia and the challenges faced in the process and the contribution made by the fisheries resources to people's livelihoods. The chapter provides a background to the study, the problem statement, the study objectives and research questions while Chapter Two presents a detailed understanding of the conceptual framework for the study.

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Chapter 2.

Conceptual Framework

2.1. Introduction

This chapter looks into the details of the theory, frameworks, and concepts as the basis for the study; these are common-pool resource theory, the institutional analysis and development (IAD) framework, the sustainable livelihood approach (SLA), 'key conditions' for a successful co-management, and legitimacy. The chapter finally describes the conceptual framework for the entire study. Chapters Four, Five, Six and Seven of this study also give more details on the specific application of the theory, frameworks and concepts discussed in this chapter.

2.2. Common-Pool Resources Theory

The current study revolves around the common-pool resources (CRP) theory, which focuses on the ability of people to collaborate to overcome governance challenges inherent to common-pool resources (Fleischman, Loken, & Villamayor-Tomas, 2014). By definition, common-pool resources, such as fisheries, are systems "where excluding potential appropriators or limiting appropriation rights of existing users is nontrivial (but not necessarily impossible) and the yield of the resource system is subtractable" (Ostrom, Gadner, & Walker, 1994:4). The CPR theory was developed in response to the works of Olson (1965) and Hardin (1968), who had both argued that groups of people were unlikely to work effectively together in the commons situations. They were right, to some extent, especially in the case of open-access resources that have no collective action-based governance system in place (Bravo & Marelli, 2008). In contributing to the CPR theory, Kateka (2010) and Saunders (2014) highlighted some limitations of the theory, namely its complexity at the local community level and the presence of multiple drivers of common resource change and degradation. However, despite these limitations, the CPR theory addresses the creation of institutional conditions under which governance and management of open-access and common-pool resources can be accomplished through a well-managed

collective action governance process. Saunders (2014) further suggested that there was a need to examine concepts that support the success of common-pool resource projects, such as participation, social capital, social learning, local community and empowerment, in a context-specific manner prior to the designing and planning of such projects.

The CPR theory is compatible with the institutional analysis and development (IAD) framework, since the formulation of this framework was based on empirical studies of common-pool resources (Ostrom, 1994, 2011). As such, the IAD framework was used as the critical guiding framework for this study's conceptual framework.

2.3. Institutional Analysis and Development (IAD) Framework

The institutional analysis and development (IAD) framework (Figure 2.1) is one that is used to identify and analyse interactions between the physical environment and socio-cultural/institutional realms (Ostrom, 1994, 2005). It has been widely employed in research aimed at studying local management and governance of common-pool resources (CPR) (Ostrom, 1994, 2005; Van Laerhoven & Barnes, 2014). Co-management is one such governance and management approach that has its roots in the work of CPR scholars, and the IAD framework has been useful in the analysis of various aspects of co-management (Whaley & Weatherhead, 2014). Therefore, the framework was an appropriate tool to organise the analysis of this study. In general, the framework concentrates mainly on the action arena where different actors or stakeholders interact with a particular action situation (e.g. the governance of a fishery) (Van Laerhoven & Barnes, 2014). The action situation is a social forum where actors interact to address common-pool resource issues and exchange goods and services; the actors are those who participate in the action situation, such as the different fishery stakeholders who were involved in this study (Ostrom et al., 1994).

Furthermore, action situations are perceived to be embedded within three levels of actions (Ostrom, 1994). Firstly, operational level actions are actions that result from decisions that are taken whenever individuals directly affect variables in a community by doing such things as harvesting fish. Secondly, collective choice actions constitute actions from decisions of a group about operational activities, e.g., the actions taken in a fishers' association to keep fish harvesting closed. Thirdly, constitutional choice actions are actions taken based on decisions

about how collective choice actions will be undertaken, e.g., the collective decision by fishery stakeholders on violators of fisheries regulations.

Furthermore, in order to study the action arena appropriately, Ostrom (1994, 2005) considered the need for the inclusion of the exogenous variables in the framework, namely:

- Biophysical environment: these are attributes of the resources in question which describe biophysical conditions and trends;
- Attributes of the community: these are attributes that affect the structure of an action arena and they include accepted norms of behaviour, the level of common understanding about action arenas, the extent to which the preferences are homogeneous, and distribution of resources among members; and
- Rules-in-use: these are working rules that are used by participants in the ongoing action arenas; these may be referred to as institutional arrangements in place.

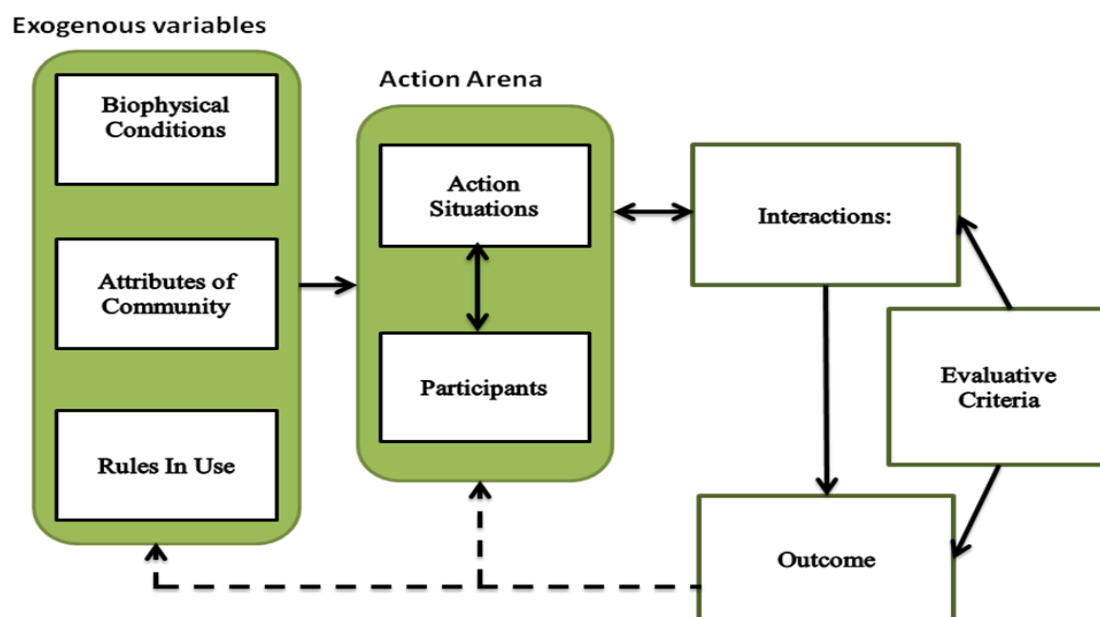


Figure 2.1: Institutional Analysis and Development (IAD) Framework

Source: Ostrom et al. (1994)

The framework also allows for drawing logical sense out of the complexity of the different groups of intervening variables which could be affecting the outcomes of the governance approach in place (Van Laerhoven & Barnes, 2014). The fisheries sector is one such sector

engulfed in several challenges of institutional arrangements and governance structures and processes that need to be addressed constantly. The framework further prevents scholars from concentrating only on one variable or aspect of the process (e.g. the social and institutional aspect) and neglecting the other aspects (e.g. the resource aspect); it adopts a holistic approach. Ostrom (1994) also showed that potential outcomes which can be analysed through the framework and the evaluative criteria, such as legitimacy, equity, efficiency, sustainability and adaptability, are also comprehensive.

2.4. Key conditions for successful common-pool resource institutions

‘Key conditions’ for successful common-pool resource (CPR) institutions were developed by Ostrom (1990; 1992) in the form of eight design principles. These principles have been useful in characterising the functionality of most robust CPR institutions dependent on different natural resources (Gari, Newton, Icely, & Delgado-Serrano, 2017; Ostrom, 1994). From the eight principles, Pomeroy and Williams (1994) developed eleven ‘key conditions’ (Table 2.1) to serve as the starting point for analysing the feasibility, success and sustainability of the co-management initiative. Various researchers have since used these ‘key conditions’ to assess and analyse the success and failure of fisheries co-management regimes (Boeh, Subade, Geganzo, & Subade, 2013; Pomeroy, Katon, & Harkes, 2001; Pomeroy, Mcconney, & Mahon, 2003; Susilowati, 2007; Pomeroy, Cinner, & Nielsen, 2011). The assessment and analysis of co-management fall under the common-pool resource theory that focuses on the collective action of stakeholders to overcome challenges to co-management and enhance its success (Pomeroy & Berkes 1997). The outcome through the analysis of these ‘key conditions’ is meant to serve as a guide for further planning at the local community, district and national levels, and implementation of co-management of the fishery (Pomeroy, Katon, & Harkes, 2001; Pomeroy, Cinner, & Nielsen, 2011). As such, these ‘key conditions’ (Table 2.1) were used in Chapter Six of this study to assess and analyse the feasibility and sustainability of the envisaged fisheries co-management approach.

Table 2.1: A description of the eleven ‘key conditions’ for successful co-management

S/No.	‘Key Condition’	Description
1	Clear boundary defined	The boundaries of the area to be managed should be distinct so that the fishers can have accurate knowledge of them.
2	Clear membership defined	Individual fishers or households with rights to fish in the restricted fishing area and participate in area management should be clearly defined.
3	Group cohesion	Fishers reside near the area to be managed.
4	Existing organisation	Fishers have some prior experience with the traditional community-based systems and with organisations, where they are representative of all resource users and stakeholders interested in fisheries management.
5	Benefits exceed costs	Individuals have an expectation that the benefits to be derived from participation in and compliance with co-management will exceed the costs of investments in such activities.
6	Participation by those affected	Most individuals affected by the management arrangements are included in the group that makes and can change the arrangements.
7	Management rules enforced	The management rules are simple; monitoring and enforcement can be effected and shared by all fishers.
8	Legal rights to organise	Fishers association or committee has the legal right to organise and make arrangements related to its needs.
9	Cooperation and leadership at the community level	There are incentives and willingness on the part of fishers to participate actively in fisheries management. Also, there is an individual or core group that takes responsibility for the management process.
10	Decentralisation and delegation of authority	The government has established formal policy and laws for decentralisation of administrative functions and delegation of management responsibility and authority to local government and local group organisation levels.
11	Coordination between government and community	A coordinating body is established with representation mainly between the fishers and government, to monitor the local management arrangements, resolve conflicts and reinforce local rule enforcement.

Source: Pomeroy, Katon, & Harkes (1998) and Pomeroy, Cinner, & Nielsen (2011)

2.5. Sustainable Livelihood Approach (SLA)

Analyses of livelihoods of local communities have usually been accomplished by the use of the sustainable livelihood approach (SLA) (Figure 2.2). This is because the SLA fits well with organisations working with rural communities in developing countries and is attributed largely to Robert Chambers' work on the 'wealth of the poor' and participatory methodologies (May, Brown, Cooper, & Brill, 2009). Chambers and Conway (1992:5) therefore defined sustainable livelihoods as follows: "A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base". Livelihoods are largely determined by the social, economic and ecological environment in which people find themselves (Chambers & Conway, 1992). However, those who are better off due to their economic growth have a more extensive choice of livelihood strategies than those who are at a low economic level (Chambers & Conway, 1992).

The SLA is mainly focused on wanting to understand how different people in different environments live, and how and why they make the choices that they make concerning their livelihoods (Levine, 2014; Scoones, 1998). Various livelihood frameworks exist (see De Satgé 2002), but the current study adopts the sustainable livelihood framework (SLF) of the Department for International Development (Department for International Development, 1999). This is because, in the SLF, variables that affect the livelihood outcomes for people's households are at play in any given local community. The SLF (Figure 2.2) shows that local people's vulnerability to shocks, stresses and seasonality, and the general policies, institutions (rules, customs, laws, and norms) and processes are the factors that usually influence their access to livelihood assets (Table 2.1). The level of influence will determine how these people employ different livelihood strategies in order to achieve their different livelihood outcomes.

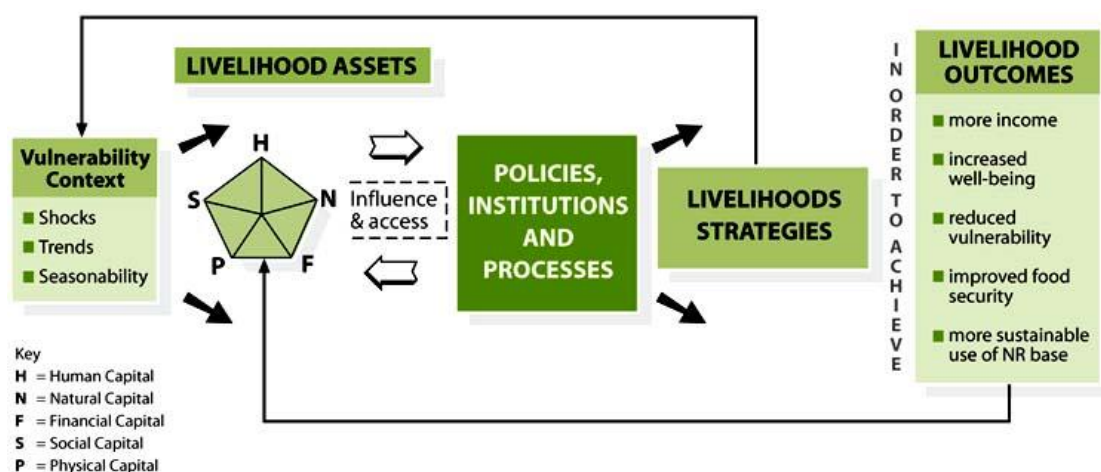


Figure 2.2: Sustainable Livelihood Framework (SLF).

Source: Department for International Development (1999)

Table 2.2: Five livelihood assets or capacities

Assets/Capital	Description
Human	Skills, knowledge, good health and ability to work that together enable people to pursue different livelihood strategies and achieve their livelihood objectives.
Social	Social resources that people can draw on, including informal relationships of trust, reciprocity and exchange with families, friends and neighbours as well as more formalised groupings (e.g. community and faith groups).
Physical	Tools and equipment that people need to be productive along with the necessary infrastructure needed to function – e.g. affordable transport and energy, decent housing and access to information.
Financial	Earned income, pensions, savings, credit facilities, state (welfare) benefits, child maintenance, etc.
Natural	Fish, soil, weather, livestock and crops which many poor people in developing countries rely on to produce their food and to obtain an income.

Sources: Department for International Development (1999) and May et al. (2009)

Nevertheless, there are criticisms that the SLF does not address issues such as conflict, violence, political instability and gender relations, and that it emphasises material assets and economics, and is too complicated to use (Collinson, 2003; Raven-Roberts, 2003). Despite all that, it remains a useful conceptual depiction of how livelihoods are shaped (Levine, 2014). It is also a useful framework for evidence-based interventions, especially in a rapidly changing

world where resources that can sustain development interventions are inadequate (Morse, Mcnamara, & Acholo, 2009).

Furthermore, over the years, the SLF has been useful in several fisheries-dependent coastal and inland communities. According to various scholars in the fisheries sector (Sarch & Allison, 1986; Béné, Mindjimba, Belal & Jolley, 2000; Allison & Ellis, 2001; Westlund et al., 2008; Kébé, Jern, Collins, Kay & Kekula, 2009; Islam, Yew & Viswanathan, 2014), the SLF has generally been useful in assessing and fostering improvement of fisheries livelihoods in local fishing communities. The assessments have been undertaken through influencing and informing local, national and regional policies and institutions, thereby promoting sustainable livelihoods and fishing of fisheries resources. It is also a framework that provides a reasonable coherence for guiding implementation and evaluating livelihood outcomes associated with co-management (Raven-Roberts, 2003).

Therefore, the SLF was used in this study (Chapter Four) to aid the assessment of livelihood assets of fishers' households, and the contribution of income from fishing and other income sources. It also aided the assessment of the impact of fishers' vulnerability to different shocks, stresses and seasonality on livelihoods, livelihood strategies employed to mitigate their vulnerability, and the influence of policy and organisational support on their livelihoods. Through the SLF, the impact of fishers' livelihood status on fisheries resources was highlighted.

Furthermore, the value of using the SLA in the context of the current study is that it considers the importance and interaction between a range of livelihood assets/capital, beyond financial capital alone. Central to this study are natural capital (e.g. fish) and social capital (e.g. level of cooperation; social groups), which are key assets and livelihood inputs into livelihood strategies (e.g. fishing), which influence livelihood outcomes (e.g. income dynamics, food security, fisheries sustainability) within a policy, legislation, institutional, and vulnerability context.

2.6. Legitimacy

Several definitions of legitimacy have emerged over the years with varying degrees of specificity. Suchman (1995:574) defines it as a “generalised perception or assumption that

the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions”. He further explains that it is a perception or assumption because it represents particular reactions of observers to a particular entity or institutional structure as they see it. It is socially construed because it depends on a collective audience yet independent of particular observers. It is a collective evaluation of an entity by both observers and participants based on how they benefit from its resources, e.g. a fishery (Tilling, 2004). Also, Levi, Sacks and Tyler (2009) state that legitimacy is derived from beliefs that citizens hold about the appropriateness of organisational structures, officials and processes.

The concept is therefore central to this study because one of its objectives is not only to assess how effective a governance approach at the fishery is, but also how appropriate, acceptable, desirable and authentic the structures and processes of the governance system are in the eyes of the stakeholders. According to Parsons in Suchman (1995), legitimacy leads to persistence of a governance approach as stakeholders are usually motivated to supply their resources to institutional structures that appear desirable, proper or appropriate. The motivation by stakeholders implies that a governance system of a resource regime that is not legitimate might not be sustainable in the long run. As such, Suchman (1995) states that assessing legitimacy is important because the indication of its presence enhances both the stability and comprehensibility of organisational activities. It also promotes the collective mobilisation of participants in a governance system with little investment and effort (Suchman, 1995).

In order to assess how acceptable and relevant governance is in a given resource regime, such as the common-pool resource, Vatn (2015) argues that the concept of legitimacy is one of the more meaningful bases to employ. He states that this is because the concept focuses on input legitimacy, that is, the participation of various actors in the decision-making process, the transparency of the process, and the accountability of decision-makers. It also focuses on output legitimacy, that is, fairness in the distribution of benefits and burdens across activities in society, and the effectiveness and efficiency of outcomes. Turner et al. (2016) equally allude to the fact that the normative beliefs about who is entitled to rule and how are shaped by the structure and processes of a given governance system and are related to factors such as effectiveness, transparency and inclusiveness. Therefore, these contents of input and output

legitimacy were used as indicators for assessing the legitimacy of governance approaches employed in Chapter Five of this study.

Different scholars of the legitimacy concept have equally used various indicators to assess the legitimacy of environmental governance systems. Turner et al. (2016) used confidence in the performance of governing institutions, trust in the information received, and perceived fairness of access to resources as indicators of legitimacy in marine fishery governance. Lockwood (2010) highlighted the following as indicators of legitimate protected area governance: validity of an organisation's authority to govern; extent to which the governing body's decisions and actions are consistent with its mandate; and the integrity and commitment with which authority is exercised. Piwowarczyk and Wróbel (2016) highlighted accountability of decision-makers, transparency and consistency of their decisions, and their consideration of the opinions of stakeholders as measures of legitimacy in the governance of marine protected areas.

2.7. Conceptual framework

Reforms centred on local community participation in the management and governance of fisheries have been high on the agenda of most African countries, including Zambia (Carlsson & Berkes, 2005). From the review by Béné et al. (2009), it appears that the fisheries co-management governance reforms implemented in Africa have at least managed to overcome the dominant central government governance system. However, Béné et al. (2009) still showed that the reforms in most cases failed to empower primary resource users in their implementation. Because of that, Béné et al. (2009) proposed that the extent of participation by the local fishing communities and other stakeholders in the decision-making processes and sustainable fishing of fisheries resources should be undertaken in tandem with the extent of decentralisation sought through co-management reforms. The reforms' failures or successes had more to do with the governance and management approaches employed than the status of the resource itself (Béné et al., 2009). Based on the current institutional and governance challenges at the Lake Itzhi-Tezhi small-scale fishery, the current study was designed as an attempt to find a solution that would address these challenges.

In the design of this study, a type of co-management arrangement was seen as an appropriate governance approach to investigate. From a definition of co-management by Carlsson and Berkes (2005), the inclusion of other relevant fishery stakeholders, besides the state and local fishers, would be an essential component in assessing the feasibility of a co-management governance approach for this study. The inclusion of other stakeholders was supported by Borrini-Feyerabend et al. (2013a), who stated that a variety of stakeholders were needed to be involved in assessing, initiating and implementing the governance of natural resources in protected areas.

Therefore, to assess the extent of this interaction by stakeholders in the fishery in question, the conceptual framework (Figure 2.3) of this study was designed by adopting concepts from the IAD framework (Figure 2.1), some aspects of the common-pool resource theory, the SLA, the ‘key conditions’ for a successful co-management, and the issue of legitimacy. In the IAD framework, Ostrom (1990) states that the initial exogenous variables influence an action arena which is comprised of several different stakeholders interacting based on an action situation at hand. In the action arena, patterns of interaction, such as cooperation, coordination and communication are established through the flow of information among different stakeholders, leading to specific outcome(s), e.g. a type of co-management, that are measured, monitored and evaluated by appropriate evaluative criteria (in this case, legitimacy and key conditions). Being a dynamic framework, outcomes in turn feed back into and influence the exogenous variables and action arena once again. Ideally, the cycle created by the framework does lead to more effective collective action, conflict resolution and reduced cost of law enforcement because of improved compliance by the local community in its governance structure (Evans, Cherrett & Pemsil, 2011). Evans et al. (2011) further state that it can equally lead to an integration of diverse knowledge where to base decisions for better problem definition, social learning and innovation. In the case of the fishery, it would also release fishers’ local knowledge and cooperation towards sustainable fishing of fisheries resources and sustenance of fish stocks in a fishery (Wilson et al., 2010). Contrary to Hardin (1968)’s famous theory that if the common resources were left to the local community, they would go to waste, Van Laerhoven and Barnes (2014) supported by other scholars stated that local communities can be very effective governors of the commons, such as fisheries resources, as long as the collective action dilemma is properly handled.

Therefore, knowledge of the characteristics of the participating fishing community in the governance approach of a fishery is cardinal in its implementation. Usually, primary users (fishers) of the commons, fisheries resources and institutions make up a community, and these regularly interact, affecting their status (Jentoft, 2000). The IAD framework is a tool used for identifying and analysing interactions between the physical environment and socio-cultural/institutional realms (Ostrom, 1994). Therefore, through this framework the study analysed the fishers' interaction with other stakeholders and the current institutional arrangements (legislation and policy) at the fishery, and how this interaction impacted on the common fisheries resource upon which the fishers largely depend. This is because the local fishing communities are essential in contributing to the preservation of healthy fish stocks, hence the emphasis on rebuilding a capable local community before rebuilding the fish stocks (Jentoft, 2000; Nkhata et al., 2009).

On the other hand, the status of the fisheries resources does affect the fishers' livelihood, and this has a significant bearing on the way they behave and make their decisions. As such, the analysis, guided by the IAD framework, considered the livelihood status of the fishers' households as a significant exogenous variable; Ntara (2015) also alluded to this aspect in her social analysis study of Lake Victoria fishery, Tanzania, as being important. The fishers' livelihood status, i.e. their assets (Table 2.1), vulnerability to shocks/stresses and livelihood strategies, were related to the status of fisheries resources, their attitude and response to institutional arrangements, the set up of other attributes of the community, and their interaction with other stakeholders in as far as governance tenets were concerned. To conduct the livelihood assessment, further concepts from the SLF (Figure 2.2) were used, such as the livelihood assets (Table 2.1) of the fishers' households, their vulnerability to stresses and shocks, the livelihood strategies they employed to cope with such shocks and stresses, and the influence of institutions, organisations and policy on their livelihoods.

As regards the interaction of stakeholders in the action arena at the local community level, community capacity and involvement in fisheries governance have been viewed as being very critical. That is why Chuenpagdee and Jentoft (2007: 659) argued that implementing any governance process involves "discerning who the users and stakeholders are, who participates and in what capacity, who wants what and why, what assets they bring and demands they raise, which strategies they employ to pursue their interests, how they actually communicate,

negotiate and decide on goals and procedures regarding how to proceed, i.e. implement, and what has been decided”.

Achieving legitimate governance is equally crucial to the success of any governance approach (Vatn, 2015). As such, the current study made use of the legitimacy criterion (Figure 2.3) as an evaluative or assessment criterion for the governance approach which was in place around the fishery, linking the same governance approach outcome back to exogenous variables and the action arena for further assessment, analysis and improvement on its performance.

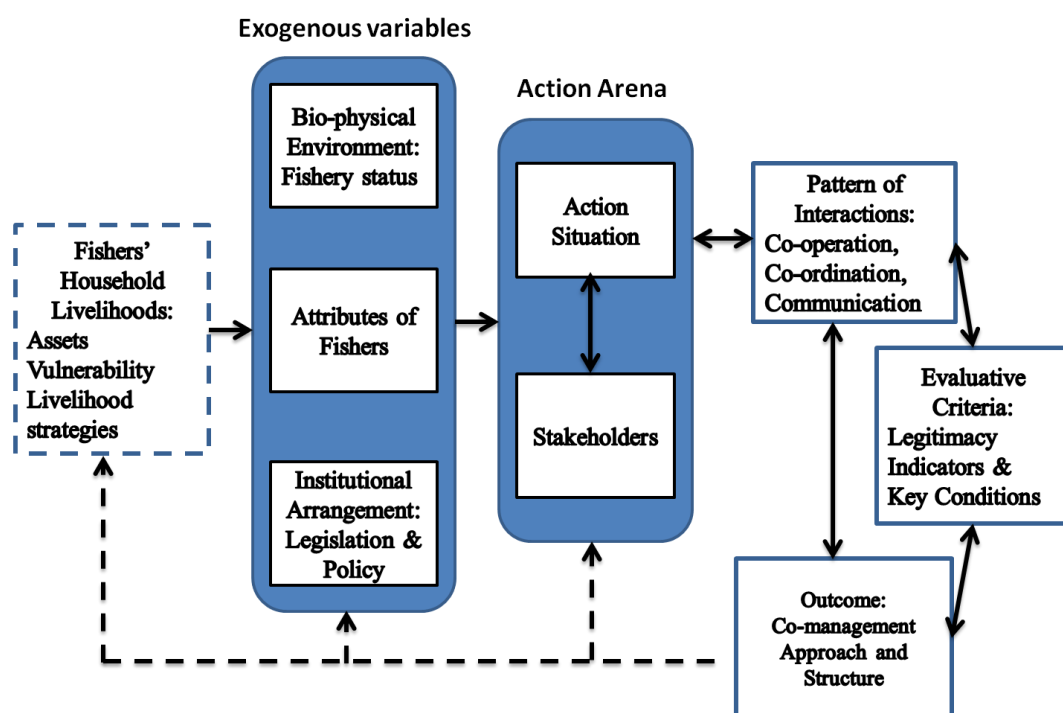


Figure 2.3: A conceptual framework for the development of a co-management governance approach for a small-scale Lake Itzhi-Tezhi fishery in the Great Kafue ecosystem, Zambia

Adapted from Ostrom, (1994) and Department for International Development (1999)

Ultimately, this study focused on analysing the feasibility of an appropriate fishery co-management governance approach and structure, its long-term impact on the status of the fisheries resources and fishers' livelihoods, and the implication of legislation and policy on

this. The feasibility and eventual success of the fishery co-management governance were also assessed and evaluated based on the ‘key conditions’ designed by Ostrom (1990, 1992) and described by Pomeroy and Williams (1994).

2.8. Chapter summary

This chapter has presented a detailed contextual framework based on a common-pool resource theory, an institutional analysis and development framework, a sustainable livelihood approach, ‘key conditions’ for a successful co-management, and on the concept of legitimacy. It has shown how theory, theoretical frameworks and concepts are linked together in order to demonstrate the feasibility of a co-management arrangement on a given small-scale fishery. The next chapter of the study presents the general methodology followed in conducting the study and describes the study area.

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Chapter 3.

Methodology and Study Context

3.1. Introduction

This chapter sets out the overarching philosophical research paradigm which gave direction to the type of research design, data-collection methods, sampling procedure and analysis techniques used. It describes the Lake Itzhi-Tezhi fishery, where the research reported in this study was conducted. Figure 3.1 provides an overview of the methodological framework that guides the overarching research approach. The components of the methodology are further explained in Chapters Four to Six.

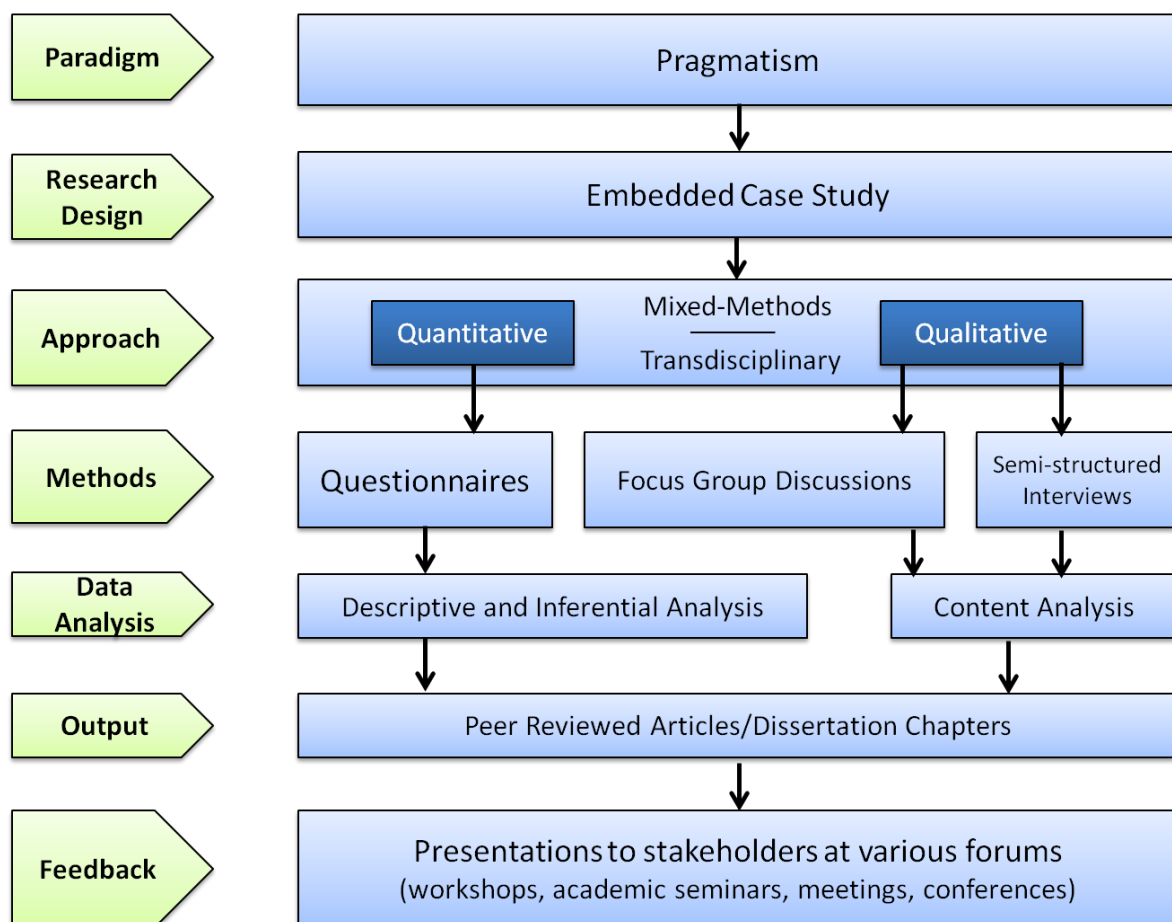


Figure 3.1: Methodological framework guiding the overarching research approach (adapted from Zylstra (2014))

3.2. Research paradigm

Although philosophical paradigms remain primarily hidden in research, they still play a critical role in the practice of research and should be recognised (Creswell, 2014). This study is guided by the pragmatic paradigm. This is because the paradigm does not focus on any one system of philosophy and reality, but allows the freedom to choose the methods, techniques and procedures of research that best meet the needs and purposes of the study (Burke & Christensen, 2014; Creswell, 2014). As such, it applies a mixed-methods approach to draw liberally from both quantitative and qualitative assumptions during the research process (Creswell, 2014). This approach enables the study to provide the best understanding of the research problem at hand; it helps to investigate factors that have the most impact on what we choose to study and how we choose to do so (Morgan, 2007).

Therefore, a transdisciplinary (TD) type of study fits in well with a pragmatic paradigm. Khoo (2017) refers to this as a pragmatic TD approach as it involves co-constructing socially relevant, transformative knowledge with actors outside academia. Pragmatic TD adopts an open approach, focusing on bringing together academic and non-academic actors or the scientific and local community to interact collaboratively to solve complicated practical problems (Khoo, 2017; Mobjork, 2010). This approach provides significant potential for transformative change towards sustainability (Lang et al., 2012; Popa, Guillermin, & Dedeurwaerdere, 2015). Furthermore, the TD approach transcends disciplinary boundaries, focuses on complex societal situations and considers the importance of creating a process that enhances mutual learning from different actors (Lang et al., 2012). The complexity of the small-scale fisheries and heterogeneity of actors in a co-management type of governance just requires such a TD approach. The approach aids co-designing and co-production of knowledge that would enhance sustainable governance of fisheries resources. The approach is equally an ideal avenue to address conflicts that usually arise between the fishing community's indiscriminate resource exploitation in order to earn a living, and the government and other stakeholders' resolve and responsibility to conserve and promote the responsible use of the resources. A co-management governance design that involves several stakeholders (Carlsson & Berkes, 2005) therefore requires an integrated approach. It was consequently necessary for this study to adopt a transdisciplinary process in the co-designing and co-creation of knowledge on the feasibility of a co-management governance approach in

order to enhance its legitimacy for the small-scale fishery. A transdisciplinary approach used in this study is therefore different from interdisciplinary and multidisciplinary approaches. According to Choi and Pak (2006) multidisciplinary draws on knowledge from different disciplines but stays within their boundaries while interdisciplinarity analyses, synthesises and harmonises links between disciplines into a coordinated and coherent whole.

Ideally, a TD approach is more participatory and demands intensive collaboration among all stakeholders at every stage of the research project, that is, stakeholders involved, methods chosen and developed, and problem addressed (Yeboah-Assiamah, 2018). This is referred to as participatory transdisciplinarity (Mobjork, 2010). However, because of the practical limitations of an individual PhD dissertation, a consulting transdisciplinarity was adopted. In consulting transdisciplinarity, stakeholders simply respond and react to the research being carried out and researchers take into consideration their perceptions during the research; the stakeholders are not actively included into the actual production of knowledge and designing process (Mobjork, 2010).

During the process of the gathering of perceptions and thoughts by the researcher for co-acknowledgement of the problem, co-identification of the source of the problem, and contributions to the designing of a co-management governance structure for the Lake Itzhi-Tezhi small-scale fishery, several stakeholders with different kinds of expertise and experience were engaged. Stakeholders from disciplines such as wildlife management, agriculture, livestock, non-governmental organisation (NGO), local government and private institutions participated. Local community stakeholders with experience in fish harvesting, fish processing and fish trading were involved. Ex-fishermen, fishers' association leaders, traditional leaders and women fish traders were equally part of the process.

3.3. Research design

Considering the complexity of the problem of over-exploitation of the fisheries resources, there remained no other appropriate approach for a sustainable solution but to carry out a learning-by-doing strategy through a pragmatic TD approach. This approach allowed the researcher, the local fishing community and other stakeholders to participate in identifying,

acknowledging and proposing solutions to address the problem at hand. Being a localised problem identified and requiring a localised solution, an embedded case study design was used in this study. Lake Itzhi-Tezhi fishery was the case in question. According to Kohn (1997:3), a case study is generally a research design that aims at “exploring new areas and issues where little theory is available, or measurement is unclear; describing a process or the effects of an event or an intervention, and explaining a complex phenomenon”. It entails an exhaustively detailed study of a social unit and enables researchers to understand the behavioural patterns of the unit concerned; in this case, the fishers (Kothari, 2004). However, a case study design does not permit generalisation of findings, and it is time-consuming and costly to execute (Kothari, 2004).

An embedded case study is a type of case study design that uses several research methods, commonly known as mixed methods, in its implementation (Scholz & Tietje, 2002). For this study, the sequential (exploratory and explanatory) mixed-methods approach to obtain both quantitative and qualitative data was adopted (Schram, 2014). In sequential approaches, data collection is done in sequence, so that the results of one dataset (e.g. qualitative dataset) influence the data collection for the next dataset (e.g. quantitative dataset) (Creswell, 2014). Furthermore, this case study depends on more holistic data-collection strategies about the embedded unit(s) of analysis for studying the main case (Yin, 2009). The choice of the research design for this study was in line with the research paradigm adopted for the study, the pragmatic paradigm that uses the mixed-method approach. This approach accords researchers the ability to address more complicated research questions and collect stronger evidence about a case than any single method alone could accomplish (Yin, 2009). Therefore, in order to achieve the research objectives, this study focused on gathering knowledge by a process of interacting with the fishing community and other stakeholders through the use of several research instruments. It facilitated the local capacity to identify appropriate actions to be taken in developing an appropriate co-management governance system in the governance of the small-scale fishery and addressing their livelihood needs.

3.4. Setting up the research

Two research assistants were identified to be part of the study from the district where the study was being conducted. Their duty was to help in arranging the administration of survey questionnaires, mobilisation of participants for focus group discussions (FGDs) and interviews, and to put in place other logistical issues. Also, prior to the administration of questionnaires, three enumerators who were familiar with the research area and the language of communication were selected from among graduates of the Kasaka Fisheries Training Institute based in Kafue, Zambia. They were trained by the researcher on how to conduct surveys with questionnaires using Open Data Kit (ODK) software on tablets. The fieldwork took place over a five month period, from March to July 2016.

3.5. Stratification of study site

At the time of the data collection Lake Itzhi-Tezhi fishery had twenty-seven fishing camps² and thirteen fishing villages³ comprising several heads of households. Most of the heads of households were residing in fishing camps at the time of the study. Because the fishing community population was heterogeneous, i.e., elements were not similar to each other in all aspects, a quota sampling method was applied in order to obtain a representative sample. Quota sampling is non-random sampling through which the researcher first identifies general categories or strata into which people would be placed and then selects the people to reach a predetermined number of participants in each stratum (Neuman, 2014). Caution was taken to ensure that the fishers from whom data were collected were those who were regularly fishing from the fishing camp or fishing village of a particular stratum. To achieve this, other appropriate sampling methods, described below, were used.

Three strata were identified based on the behavioural patterns of the fishers in relation to the features of the locations of the different fishing sites, the distance of fishing sites from homesteads, and the way they accessed these fishing sites (Table 3.1). The behavioural

² A temporary place by the lake set up by the fishers where they stay in temporary shelters as they conduct their fishing activities during the fishing season.

³ A permanent residential area along the lake shore where the fishers reside as they conduct their fishing and other activities

patterns of fishers were considered to be critical in affecting the fishers' responses to research questions, hence the choice of the quota sampling method for the study units as a way of reducing the external sampling errors.

The actual number of fishers around Lake Itzhi-Tezhi fishery was not known at the time of the study. Therefore, the population was estimated by compiling the number of fishers at each fishing camp and in each fishing village with the help of appointed fishing camp chairpersons and village headmen respectively. Officials from the Department of Fisheries also assisted. Approximately, 1,800 fishers were identified by adding the population of fishers of the 3 strata from which the 451 sample size was derived based on a 95% confidence level. This implies that 25% of the total population of fishers gives a 95% probability of being true (Tables 3.2 and 3.3).

Table 3.1: Description of research strata

Stratum	Description
One	Comprised of fishing camps and sites in the National Park, far away from the fishers' homestead. Fishers used mostly motorised boats to get to these fishing camps on islands and along the lakeshore. Fishers could spend one or two months in fishing camps without getting back to their homesteads.
Two	Comprised of fishing camps and sites in the National Park - these fishing camps were located along the shore of the lake, but were not as far as those in Stratum One from the fishers' homesteads. As such, they could easily access their fishing camps simply with their canoes from their homesteads. They could also get back to their homesteads two to three times a month.
Three	Comprised of fishing villages where fishers themselves resided while accessing fishing sites on the lake with their canoes. As such, there was no need for fishing camps in this stratum.

A proportional quota sampling technique (Alvi, 2016) was used to select the total sample sizes (quota) of both fishing camps and fishing villages in each stratum. The reason for using the non-random sampling method was because only 19 out of 40 fishing camps and fishing villages at Lake Itzhi-Tezhi fishery were inhabited by fishers at the time of the actual data collection. By this technique, the number of fishers was drawn from each stratum in the same proportion as they are in the population (Table 3.3), unlike the non-proportional quota

sampling, where the number of units drawn from the strata is independent of the size of the population (Alvi, 2016). Furthermore, probability sampling (stratified random sampling) was not possible as most of the fishers were not available on site in some fishing locations of each stratum.

Therefore, the twelve fishing camps and fishing villages were purposefully selected based on the presence of a reasonable number of fishers at each fishing camp or fishing village. The selected camps and villages were 5 fishing camps from Stratum One, 3 fishing camps from Stratum Two, and 4 fishing villages from Stratum Three (Table 3.2). One of the 3 fishing camps from Stratum Two was not attended because of logistical challenges. Hence, 11 of the 12 selected fishing camps and fishing villages were visited for data collection.

Table 3.2: Total number and sample size of fishing camps and fishing villages in each stratum

Total number and sample sizes	Strata			Total number of fishing camps or fishing villages
	One	Two	Three	
Total number of fishing camps and villages in each stratum	17	10	13	40
Sample size of fishing camps and villages in each stratum	5	3	4	12

Source: Author

3.6. Data collection methods

3.6.1. Survey using questionnaires

A survey is a method that aids to collect primary data for describing a population too large to study directly and it makes use of standardised questionnaires which provide data for onward analysis and interpretation (Babbie & Mouton, 2001; Kothari, 2004). The mixed questionnaire (see Appendix A) was designed using different types of questions in order to get more survey responses for different components linked to each research objective of the study. The kinds of questions used were the following: demographic (gathering information about a respondent's background or income level), dichotomous (two opposite choices),

ordinal (question displaying a scale of answer options from any range), Likert scale (standardised response categories to measure respondents' attitude or opinion towards a given subject) and multiple-choice (the selection of one or more options from a list of answers that one defines) (Ghosh, 1992; Babbie & Mouton, 2001). A few questions were open-ended in order to capture more details on some aspects. More details are presented in Chapters Four and Five on how survey questionnaires were used to collect specific data.

A snowball sampling method (Singh & Masuku, 2014; Alvi, 2016) was used in each selected fishing camp or fishing village within each stratum to select adult respondents or fishers (≥ 18 years old) to whom the questionnaires were administered. Although subject to sampling bias, this sampling method was the most appropriate for this study because the fishers were not readily available in the fishing camps and fishing villages. Those who were available could only be identified by their fellow fishers, especially in the fishing villages. In this type of sampling, the selected fishers in each stratum were asked to nominate other practising fishers known to them (Alvi, 2016). Sampling bias was reduced by ensuring that the selected respondents were the actual fishers, as confirmed by the representative of a particular fishing camp or fishing village, and were encouraged to participate in the study.

Table 3.3: Population and sample size of fishers in each stratum at Lake Itzhi-Tezhi fishery

Population and sample sizes	Strata			Total population and sample sizes of fishers
	One	Two	Three	
Population size of fishers in each stratum	1062	403	335	1800
Sample size of fishers in each stratum	266	101	84	451

Source: Author

A pilot study using 20 questionnaires (Sheatsley, 1983) was first conducted with fishers in one of the fishing camps in order to pre-test the questionnaire's validity, reliability and

practicality⁴ (Kothari, 2004). These fishers and results of the pilot study were not used in the actual study.

Data were collected using Open Data Kit (ODK) software. The ODK is an open-source software that helps researchers in the field to easily collect, manage and use the data. It makes use of an android platform on a mobile phone or tablet to collect survey data and have it transmitted to an established database for further data analysis.

3.6.2. Focus group discussions

A focus group discussion (FGD) is a research undertaking in which participants with a similar interest are invited to take part in a group discussion concerning a particular research topic (Bless, Higson-Smith, & Sithole 2013). Despite requiring the role of a facilitator and providing less depth and detail from individual participants, the general characteristics of the FGD are people's involvement. Organising FGDs requires holding several meetings, the homogeneity of participants based on similar interests, and substantial interaction of participants on the research topic (see Appendix B for structure of questions) (Babbie & Mouton, 2001; Bless, et al., 2013; Freitas, Oliveira, Jenkins, & Popjoy, 1998; Morgan, 1997).

Participants for focus group discussions were selected on the basis of purposive sampling. This implies that the investigator decides what is supposed to be known and goes out to find participants possessing the ability and willingness to provide data according to their experience and knowledge (Bless et al., 2013). However, this sampling method required impartiality, working without bias and having the necessary experience on the part of the researcher to make sound judgements in the selection process (Kothari, 2004). As such, the principal researcher, who had gone through training on different data-collection methods, guided the selection process and facilitated the FGDs. Through a sequential exploratory approach across all the strata, the general data collected through FGDs helped to structure questionnaire questions to capture specific details on a particular issue from individual fishers (Creswell, 2014). This technique of data collection ensured the uniformity, validity and reliability of data (Babbie & Mouton, 2001). Note-taking, observations and audio recordings

⁴ The practicality characteristic of a measuring instrument can be judged in terms of economy, convenience and interpretability (Kothari, 2004)

(with the permission of the participants) were used to collect as much data as possible. More details on the application of FGDs are presented in Chapters Four, Five and Six.

3.6.3. Semi-structured interviews

Semi-structured interviews are those that comprise several primary questions with the aim of defining areas for investigation, but also permit the interviewer or interviewee to digress from them so as to trail detailed responses and information (Britten, 1995). All interview methods followed accepted social science protocols (Babbie & Mouton, 2001; Bless et al., 2013). Specific details of these interviews are presented in Chapters Four, Five and Six. Audio recordings (with the permission of the interviewees) and note-taking were used to collect data from the interviewees.

3.6.3.1. *Key informants*

Purposive sampling was used to identify and select people from whom reliable information, on the basis of their knowledge or experience, could be derived on the issue under consideration at the time (Babbie & Mouton, 2001; Bernard, 2011; Bless et al., 2013). Semi-structured interviews were used to collect data on views, opinions, and ideas from the key informants.

Key informants comprised of key stakeholders (Table 3.4) in the Lake Itzhi-Tezhi fishery. Interviews were conducted to elicit their perceptions on various aspects (see Appendices C and D for details). However, not all stakeholders had the same level of interest in the wellbeing of the fishers. Primary stakeholders assumed a more active role in the governance and management of the fisheries resources and livelihood needs of fishers. Secondary stakeholders played consultative roles and provision of other needed resources in the process (Borrini-Feyerabend & Buchan, 1997). The key informants were also 2 retired fishers who had worked for a long time in the fishing business on Lake Itzhi-Tezhi (Figure 3.4). Data were collected from them based on their experience (see Appendix C for the structure of questions).

Table 3.4: Key informants interviewed

Serial No.	Interviewees	Number
1	Central government departments (fisheries, agriculture, livestock and wildlife)	5
2	Local government	1
3	District Commissioner's Office	1
4	Private organisations	2
5	Non-governmental organisations (NGOs)	1
6	Fishermen and Fish Traders Association (FFTA)	1
7	Kaingu chiefdom headmen	4
8	Old retired fishers	2
TOTAL		17

Source: Author

Through a sequential explanatory approach, the interviews were used to explain and confirm earlier views gathered from fishers through the FGDs and questionnaires. The approach ensured the validity and reliability of data being collected for the study (Ghosh, 1992; Creswell, 2014). Purposive sampling was used to select the interviewees based on their knowledge of and level of interaction with fishers and their fishing business.

3.7. Data analysis

Data analysis is the process of computing certain measures and searching for patterns of relationships that emerge from among data groups (Kothari 2004). Having used a mixed-method approach to collect different data groups, both qualitative and quantitative data collected were analysed. Quantitative data were the type of data collected which was analysed numerically, the results of which were typically presented using statistics, tables and graphs (Acaps, 2012). Qualitative data were textual observations that conveyed attitudes, perceptions or intentions and are, usually, exploratory (Acaps, 2012). Qualitative data were analysed using content analysis. This kind of analysis is a “research method for making replicable and valid inferences from data to their context, with the purpose of providing knowledge, new insights, a representation of facts and a practical guide to action” (Krippendorff, 2004:18). The method was used to analyse interview and FGD transcripts, and both qualitative and quantitative approaches were included in the analysis of qualitative data.

For Chapters Five and Six, qualitative data collected through FGDs and interviews were analysed quantitatively by way of categorising themes on the transcribed scripts based on the research questions. The subjects' responses (quotations) were then coded in relation to the different themes that emerged. After that, counting of the frequency of certain words and phrases and other manifest content was done and then assessed accordingly (Babbie & Mouton, 2001). For Chapters Four, Five and Six, the literal and most spoken phrases captured through interviews and FGDs were also quoted during the analysis and interpretation of data to emphasise the point (Babbie & Mouton, 2001).

This method of content analysis fits in well with the Atlas.ti qualitative data-analysis software (Babbie & Mouton, 2001) which was used in this study. Atlas.ti is a computer-aided qualitative data-analysis software (CAQDAS) designed to help analyse qualitative data gathered with the use of qualitative research methods (Babbie & Mouton, 2001).

Quantitative data collected through questionnaires were analysed using the Statistical Package for Social Sciences (SPSS) software, IBM 20 (2014). Multiple responses with repeated answers were categorised and tallied to get the frequency distributions for each variable (de Vaus, 1996). Discrete variables were summed up by the frequency of each code derived from the questionnaire. Summary statistics were then calculated for all numerical variables. Categorical data on the perceptions of respondents were analysed based on their responses.

The data collected were nonparametric in nature, that is, non-normally distributed, not continuous (ordinal and nominal), and not possessing equal variances. Therefore, the following tests were used for the analysis: ordinal logistic regression, chi-squared and Cramer's V.

Ordinal logistic regression analysis was used in Chapter Four to predict the extent to which the set of independent variables (continuous, nominal or ordinal) had a statistically significant influence on the dependent ordinal variables (Mehta & Kellert, 1998; Alexopoulos, 2010). This was based on the assumption that the independent variables were not highly correlated with each other (Alexopoulos, 2010). A stepwise method was used to include predictor

(independent) variables, one at a time, such as would have made a statistically significant contribution if added to the model (SPSS, 2008).

The chi-square was also used in Chapters Four and Five to determine the presence or absence of associations or relationships between two categorical variables. The Pearson Chi-Square (χ^2) was used where not more than 20% of expected cell counts were less than five, while the Maximum Likelihood Ratio (ML χ^2) Chi-Square was used where 20% or more of the expected cell counts were equal to or more than five (Mchugh, 2013). Cramer's V (v) was used to measure the strength of the associations by the chi-square analysis measuring more than 2x2 tables of the variables (Colignatus, 2007). See details in Chapters Four and Five.

Reliability and validity were addressed through the use of different sources of data; this is referred to as triangulation and is what increases the trustworthiness of research data (Bless et al., 2013). Reliability is “an estimate of the accuracy and internal consistency of a measuring instrument”, whereas validity is “the degree to which a study measures what it purports to measure” (Bless et al., 2013:394,395). The concept of methodological triangulation entails that “multiple methods are used for collecting and analysing data so that all sources converge on the facts of a case” (Kohn 1997:7). As such, for this study data were collected from a group of people with divergent views through FGDs, and from individuals through interviews and surveys, thus depicting methodological triangulation. The type of questions asked in FGDs, interviews with key informants, and surveys were consistent (See Appendices B, C and D). These questions were designed to address the research questions and objectives for this study.

Furthermore, a quota sampling technique was used because the fishing camps and fishing villages around the lake were grouped into strata, which allowed for getting precise estimates of the sample from each of the 3 strata. This technique further helped to ensure the validity and reliability of the whole study, because the analytical focus was on the individual stratum in relationship to the other strata and eventually to the whole case (Kohn, 1997; Kothari, 2004)

The study also endeavoured to gather views from a diversity of stakeholders in the fishery. The approach was meant to cover a broader view of perspectives in order to avoid bias (Kohn, 1997).

3.8. Ethical issues

Ethical issues are the concerns, dilemmas and conflicts that arise over the proper way to conduct research, and ethics defines what is or is not legitimate to do, or what a morally sound research procedure involves (Neuman, 2014). This study was therefore approved (SU-HSD-001683) by the Humanities Research Ethics Committee (HREC) at Stellenbosch University before data collection could commence. Upon approval of the study and its instruments, data collection was conducted according to accepted and applicable national and international ethical guidelines and principles.

The study ensured that any risk that would impact negatively on the research participants and other stakeholders involved in the research was avoided or minimised as much as possible, as stipulated in the policy for responsible research conduct at Stellenbosch University. The study was conducted in the Kafue National Park where Memoranda of Understanding (MoU) between the government through its departments and institutions of higher learning, in this case, Department of National Parks and Wildlife (DNPW), Department of Fisheries (DoF) and the Copperbelt University were signed for the purpose of collaboration in research activities, training, use of facilities and research sites, accessing of data sources, and other issues. Permission was sought in written letters and was granted by these institutions.

Furthermore, this study fell under a larger NORAD-funded project called NORHED PROJECT, whose aim and objectives were already known by the government departments mentioned above. Permission was also sought, through a written letter, from other persons and institutions that were outside the scope of the MoU, but whose data were important for this research. These included the District Commissioner's office, Zanaco Bank, Department of Agriculture, Department of Livestock and Veterinary Services, Itezhi-Tezhi District Council, Fishermen and Fish Traders Association (FFTA) and traditional authorities. Consent was sought from all the research participants through written scripts which were designed in

tandem with the Stellenbosch University guidelines and requirements. Data collected sought the views, opinions, ideas and attitudes of the participants relevant to the problem under investigation. Being a participatory kind of research, the outcome of the research at every stage was made known to the participants. All data collected from the participants were stored on the ONA platform and at the Directorate of Information and Communication Technology (DICT) based at the Copperbelt University, Zambia, for the sake of security and confidentiality. There was no conflict of interest in this study.

3.9. Study area and context: Lake Itzhi-Tezhi Fishery, Zambia

Zambia is a landlocked country endowed with Forty-Two million hectares of land and 40% of total surface water in Central and Southern Africa (Zambia Development Agency, 2011). The country's water resources are in the form of streams, rivers, swamps, reservoirs, and lakes (ACF/FSRP, 2009). In these water bodies, there are nine major fisheries (Figure 1.1), namely, Lake Kariba, Lake Tanganyika, Lake Itzhi-Tezhi, Lake Bangweulu, Lake Mweru Luapula, Lake Mweru-Wantipa, Kafue River (Kafue flood plain), Upper Zambezi River (Barotse flood plain) and Lukanga Swamps (Mudenda, 1999). There also minor fisheries which include Lusiwashu dam, Lower Zambezi River and Chambeshi River (Government of Zambia, 2010). These fisheries jointly have more than 400 fish species. However, only 17 species can be considered commercial species (ACF/FSRP 2009)

Most of the fishery areas have open access to their resources by fishers, except the two estuaries on Lake Mweru (Mifimbo and Kalungwishu) that were gazetted as breeding sites (Government of Zambia, 2004). Furthermore, of all the fisheries, two are part of national parks and access to their resources is prohibited except with a park entry permit and fishing licence. These include Nsumbu National Park that covers part of Lake Tanganyika and Kafue National Park (KNP) that covers the largest portion of Lake Itzhi-Tezhi (Figure 3.2) (Government of Zambia, 2004).

The KNP is one of the largest national parks in Africa, covering an area of about 22 400 km² (Figure 1.1). It is located in the south-central part of Zambia between latitude 14°03'S-

16°43'S and longitude 25°13'E-26°46'E. The KNP has established human settlements in all its game management areas (GMAs) (Mwima, 2001).

The KNP is rich in diversity of natural resources and forms one of the most important terrestrial ecosystems in Africa (Mwima, 2001). It has three main rivers that flow through it, namely Lufupa River, Lunga River and Kafue River (Mwima, 2001). The active fisheries in the KNP and GMAs include Lake Itzhi-Tezhi in KNP, the Busanga wetlands in Kasonso-Busuanga GMA, the Hooks Bridge fishery in the Mumbwa GMA, and the Kafue floodplains which covers several GMAs (Mwima, 2001). For this study, only Lake Itzhi-Tezhi fishery was investigated (Figure 3.2).

Lake Itzhi-Tezhi lies in the KNP and shares borders with the Namwala and Nkala GMAs. This human-made lake is found in the Central province of Zambia at 15° 46'S and 26° 02'E (Figure 3.2) (Mbewe, 2000). The lake was formed by building a dam wall across the Kafue River in 1977. The lake covers 370km² when the water level is 1029m above mean sea level. The highest water retention level is about 1030.7 m.a.m.s.l., and the maximum depth of the lake is about 55 m, while the mean is 15.4 m (Godet & Pfister, 2007). The water stored in the lake is used for generating hydroelectricity at the Itzhi-Tezhi Hydropower Station and at the Kafue Gorge Hydropower Station, 418 km downstream. Apart from the Kafue River, all other rivers entering the lake are seasonal; the period of flow depends on the amount of rainfall for a particular year (Swedish Consultants, 1971).

The lake is divided into 2 strata for fishery management purposes (Department of Fisheries, 2014). Stratum One is located on the south-western direction from the dam wall. It has 19 fishing camps or temporary shelters that lie entirely in the KNP, which is under the jurisdiction of the DNPW. Entry into this stratum is restricted except through a park entry permit issued by DNPW. Among other responsibilities (Table 3.5), DNPW controls, manages, conserves, protects and administers national parks, community partnership parks (CPP), bird and wildlife sanctuaries, and game management areas (GMA) countrywide. The fishing community carry out their fishing activities in the lake for nine months every year. Fishing licences which grant fishers access to fishing sites on the lake are issued by the Department of Fisheries (DoF) every month. Among other responsibilities (Table 3.5), DoF is mandated to conserve, manage and develop fisheries resources in a sustainable manner.

Every year, the Fisheries Act mandates the DoF to enforce a ban on fishing during the three months of the closed fishing season (December to February) (Department of Fisheries, 2014). Being small-scale fishers, they use small dug-out canoes that can accommodate only 1 or 2 fishers. Furthermore, as a fisheries resource conservation measure, multi-filament gillnets of 3.0 inches (76 mm) and above and monofilament nets of mesh size not less than 4.75 inches (120 mm) were the legalised mesh sizes for gillnets, while seine or drag nets of any kind were prohibited by law (Mbewe, 2000; Cowx et al., 2011). The lake has over thirty fish species, but only eleven of them are harvested, particularly *Oreochromis andersonii*, *Tilapia rendalli*, and *Schilbe intermedius* (Mbewe, 2000; Department of Fisheries, 2014, 2017).

Table 3.5: Some major responsibilities of the Department of Fisheries and Department of National Parks and Wildlife

S/No.	Responsibilities	
	Department of Fisheries	Department of National Parks and Wildlife
1	Conserve, manage and develop fishery resources and waters sustainably.	Control, manage, conserve, protect and administer national parks, community partnership parks (CPP), bird and wildlife sanctuaries, and game management areas (GMAs).
2	Manage, develop and protect aquaculture, aquatic vegetation and fish habitats.	In partnership with local communities, share the responsibilities of management in CPPs and GMAs.
3	Create an environment of cooperation and consultation with local communities, civil societies and other public institutions.	Adopt methods for sustainability, conservation and preservation in the natural state of ecosystems.
4	Allocate money from the Aquaculture and Fisheries Development Fund;	Sensitise and educate the public on the necessity of wildlife conservation.
5	Protect fish stocks from the effects of pollution and any other harmful effects.	Enhance the economic and social wellbeing of local communities in or around CPPs and GMAs.
6	Promote community-based fisheries management.	Pay out monies into a fund established by a board and regulate the use of it.
7	Issue, vary, suspend and revoke any permits and licences for fishing and other activities.	Issue licences, certificates and permits.

Sources: Fisheries Act (22 of 2011) (Government of Zambia, 2011); Wildlife Act (14 of 2015) Government of Zambia, 2015)

Stratum Two is located in the northern direction from the dam wall, and it is comprised mostly of permanent settlements or fishing villages. On the eastern, southern and part of the

northern side of the lake lie villages under four prominent chiefs (Figure 3.2), namely, Kaingu, Musungwa, Shimbizi and Shezongo. Resident⁵ and immigrant⁶ fishers reside in these villages.

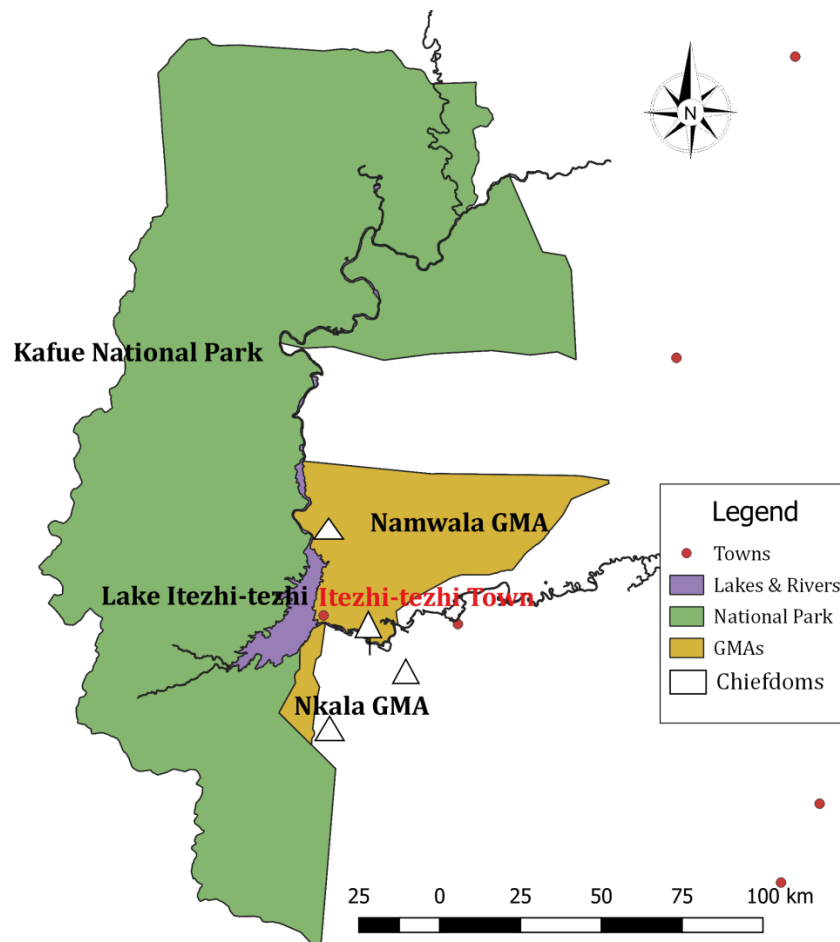


Figure 3.2: Map showing Lake Itezhi-Tezhi fishery, Kafue National Park, GMAs, and chiefdoms

Source: Author

The lake is situated within the Itezhi-Tezhi district, which had the fastest growing population in the Southern province of Zambia, with an average annual population growth of 4.8% per

⁵ For this study: fishers who migrated to this fishing community to stay there permanently or temporarily.

⁶ For this study: fishers who were born in this fishing community and have continued to stay there.

annum in the 2000-2010 intercensal period, growing from 43,111 to 68,599 (Central Statistics Office, 2014). The district accommodates government offices, health centres, trading facilities and housing units. It is about 347 km from Lusaka, the capital city. Some of the available income-generating activities for the people here include small-scale fishing, small-scale farming, livestock rearing, trading and formal employment in government departments, electricity company (Zesco) and lodges around the lake (Department of Fisheries, 2014).

3.10. Chapter summary

The chapter provides a general overview of the methodology, that is, the particular procedures or methods used to identify, select, process and analyse information for the research subject. Firstly, the chapter discusses the pragmatic research paradigm that provides a broad philosophy upon which the overall study was based. The chapter then describes how an embedded case study design fitted the research paradigm well with the use of the mixed-methods approach as a means for data collection. The chapter further describes in detail the sources of data for the study, sampling techniques used, instruments for primary data collection and their appropriateness, and the means of data analysis. It highlights how ethical issues were addressed to conduct the study. The chapter ends with a description of the study area, Lake Itezhi-Tezhi fishery, which is the primary source of empirical data used in the chapters of the study that follow.

The next chapter is a peer-reviewed journal article that details the contribution of small-scale inland fishing to livelihoods of local fishers' households, the extent of their vulnerability, their livelihood coping strategies and the implications of that for policy making and the implementation of co-management in the context of this study.

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Chapter 4.

Small-Scale Fishing: Income, Vulnerability and Livelihood Strategies at Lake Itzhi-Tezhi⁷

Abstract

There is still a need for appropriate livelihood strategies to improve livelihoods of small-scale fishers, despite several roles the African inland fisheries play to fishers' wellbeing. This study assessed the nexus between small-scale fishing and fishers' livelihoods at Lake Itzhi-Tezhi, Zambia. Using the mixed-methods approach under a sustainable livelihood framework, findings revealed that the fishing income was critical to fishers' livelihoods. However, it was insufficient to improve their livelihood assets due to the low fish catches per fisher. Deficiency in fishing income was compounded by fishers' vulnerability to shocks caused mainly by the effects of the closed fishing season and crop/livestock production failures. As such, the study suggests, among other strategies, the support of fishery stakeholders towards alternative income sources and development of a livelihood-inclusive fisheries policy framework to help enhance the livelihoods of fishers at Lake Itzhi-Tezhi fishery. Beyond this lake fishery, this study contributes similar strategies as lessons for addressing the fishers' livelihood challenges and promoting sustainable fishing.

Keywords: fishers, fisheries, Lake Itzhi-Tezhi, livelihood, vulnerability, Zambia

4.1. Introduction

In many parts of Africa, communities near perennial rivers and water bodies rely on small-scale fishing for their livelihoods (FAO, 2016; Lynch et al., 2017). The small-scale inland fishing sector plays a vital role in the provision of food, nutrition, income, and employment for local livelihoods (Welcomme et al., 2010; Weeratunge et al., 2014; FAO 2016). The

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sector also provides basic needs for poorer households in unforeseen circumstances (Béné, 2006; Welcomme et al., 2010). Income from fishing is critical in meeting household needs and securing safety nets among local small-scale fishers (Béné, 2006; Ngoma, 2010; Isaacs, 2012). The Sector has also empowered women with opportunities to contribute to household food security and income through fish processing and trading (Welcomme et al., 2010; Hauzer et al., 2013; Lynch et al., 2017). However, the small-scale fishing sector still experiences challenges despite the significant role it plays.

In Africa, the small-scale fishing sector has been frequently overlooked by policymakers in rural development planning, rural economic development, and pro-poor growth policy formulation, which is mainly due to the lack of reliable data on its economic contribution (Béné et al., 2009; Weeratunge et al., 2014; De Graaf et al., 2015). This neglect of the sector has resulted in most inland fisheries resources being overexploited, thus threatening the sustainability of these resources in the absence of appropriate legislation, policies and functional resource governance arrangements (Kébé & Muir, 2008; Kleibe et al., 2015; Harper et al., 2017). Further, the open-access nature of most inland fisheries has resulted in overfishing and reduced fish catches, thus negatively affecting the fishers' fishing income in the absence of alternative livelihood strategies (Yuerlita, 2013). Having been overlooked for a long time, the sector has also predisposed the small-scale fishers' livelihoods to vulnerability by various stresses and shocks, such as increasing population of fishers, water level fluctuations (climate change effects), illegal fishing practices, and limited access to other income sources (Mills et al., 2011; Yuerlita, 2013). The high level of vulnerability could be the reason why Belhabib et al. (2015) in their study of fisheries in West Africa also affirmed the small-scale fisheries sector to be more of an activity of last resort than a source of sustainable livelihood. However, contrary views exist in literature to this affirmation because of several factors at play (Allison & Ellis, 2001; Béné et al., 2003; Béné & Friend, 2011; Onyango, 2011). As such, the debate continues on the relationship between fishers' livelihoods and sustainable fishing.

According to Béné and Friend (2011), there was no stable causal relationship between fishing and the fishers' vulnerability and poverty, hence the debate. Besides, Béné et al., (2003) had earlier stated that the relationship between fishing and poverty level of fishers' households was a complex one. This complexity is because of different factors, such as geographical

location (country and fishery-specific), economic status of fishers, lack of education, lack of entitlement to the fisheries, lack of infrastructure, resource governance failure, lack of policy and legislation, and limited market access, impacted on livelihoods and fishing (Béné et al., 2003; Béné & Friend, 2011; Kadfak, 2019).

Further, given the negative impact of the neglect of the small-scale fisheries sector, voluntary guidelines for securing sustainable small-scale fisheries (the SSF Guidelines) in the context of food security and poverty eradication were endorsed in 2014 by over 100 countries under the auspices of the Food and Agriculture Organization (FAO). These guidelines are intended to guide governments and other stakeholders to collaborate and ensure sustainable fisheries for the benefit of small-scale fishing communities and society at large (FAO, 2016). Despite the endorsement of these SSF Guidelines, implementation in many developing countries has been very slow, hence exerting little or no impact on fishers' livelihoods (FAO, 2016). Additionally, even where African governments have developed policies that promote small-scale fishers' participation in the governance of fisheries resources, weak implementation has resulted in their weak contribution to sustainable livelihoods among small-scale fishers (Béné et al., 2008; Nunan et al., 2015). The central government top-down governance approach in these countries has been responsible for the weak implementation of these policies as the approach has had no mandate of devolving responsibilities, power and authority to the local fishing community (Neiland et al., 2005; Neiland, Madakan & Béné, 2005; Ogutu-Ohwayo & Balirwa, 2006; Béné et al., 2008; Lawrence, 2015). Further, the issue of sustainable fishing and fishers' livelihoods was also fishery and country-specific due to the peculiarity of each fishery and country (Isaacs, 2012). As for Zambia's fisheries, there is little literature that highlight strategies to enhance the livelihoods of small-scale fishers as a means of mitigating the unsustainable fishing and overexploitation of the fisheries resources.

Zambia is a landlocked country that is endowed with nine major inland fisheries (SADC, 2016), with small-scale fishing being the main activity. Inland small-scale fishing involves low investment by the individuals who fish in lakes, rivers, streams, wetlands, and reservoirs, thus making it affordable for people with low incomes (FAO, 2009). In Zambia, poor people comprise 76% of the rural population (CSO, 2014), and small-scale fishers are part of this population.

In 2014, the Zambian fisheries sector supported about one million people, approximately 6.5% of the entire population (DoF, 2014a). However, the fish consumption rate reduced from 12 kg per capita per annum in the 1970s to 7.7 kg in 2012 (Kefi & Mofya-Mukuka, 2015), which is probably due to the open-access nature of the fisheries that led to the overexploitation of their resources (DoF, 2015). Kefi and Mofya-Mukuka (2015) also stated that Zambia's overexploited resources seem to have negatively affected the small-scale fishers' livelihoods, hence the reported high poverty levels among them.

To address the issue of resource overexploitation that had a bearing on the small-scale fishers' livelihoods, pieces of legislation were included in the amended Fisheries Act (22 of 2011) (Government of Zambia, 2011). These legislative pieces mandated the local fishing community to participate in the governance process of the fisheries. That entails incorporating fishers into the Fisheries Management Committee, a decision-making committee designed to preside over the governance and management of fisheries resources, as active members. This arrangement was meant to enhance sustainable fishing in the country's water bodies, thereby addressing the livelihoods of small-scale fishers (Haambiya et al., 2015; Kefi & Mofya-Mukuka, 2015). However, the impact of this legislation on the livelihoods of fishers' households was still unknown given the continuation of fisheries resource overexploitation in most fisheries.

Considering the numerous factors that affect the small-scale fishers' livelihoods, country and fishery-specific studies are still needed to explore the relationship between their livelihoods and sustainable inland fishing (Lynch et al., 2017). This study aimed at contributing to this debate. This knowledge is meant to help mitigate the unsustainable fishing and overexploitation of the fisheries resources for the benefit of the fishers' livelihoods. The objective of this study was to assess the contribution of small-scale fishing on Lake Itzhi-Tezhi to the livelihoods of local fishers' households, the extent of their vulnerability, the livelihood coping strategies employed, the impact of legislation on these livelihoods, and the recommendations thereof. The objective was addressed by answering the following research questions:

- i. What is the contribution of income from fishing to fishers' livelihood capital?
- ii. To what extent has stakeholders, vulnerability, and legislation affected the fishers' livelihoods and their fishing?

- iii. What are the fishers' livelihood strategies, and how have these strategies affected their livelihoods?

4.2. Methodology

4.2.1. Study site

Man-made Lake Itzhi-Tezhi (Figure 4.1) lies on the Kafue River at 15° 46'S and 26° 02'E (Swedish Consultants, 1971). A dam, built in 1977, formed the lake of 392 km² with a maximum depth of 55 m (Godet & Pfister, 2007). Upon completion of the dam, the lake became an essential source for the livelihoods of the majority of the people who were now unemployed and had settled by the lake (Old retired fisher, personal communication, July 12 2016).

A large portion of the lake lies in the Kafue National Park (Figure 4.1). The Department of National Parks and Wildlife (DNPW) and the Department of Fisheries (DoF) collaborate in conducting law enforcement activities on the lake such as control of illegal fishing practices and implementation of the closed fishing season programme (Ngoma 2010). The closed fishing season is from December to February (Department of Fisheries, 2014b), and fishers look for alternative sources of income during this period.

The lake is situated within the Itzhi-Tezhi district. Available income-generating activities for the people in the district include small-scale fishing, small-scale farming, livestock rearing, and trading in addition to formal employment in government departments, the electricity company, and the lodges around the lake (Department of Fisheries, 2014b).

During the study period, the fishing community comprised immigrant and resident fishers. These fishers resided in the chiefdoms of four prominent chiefs, namely, Kaingu, Shimbizi, Musungwa, and Shezongo on the northern, eastern, and southern sides of the lake (Figure 4.1). (See more details on the study site in Chapter Three, Section 3.9).

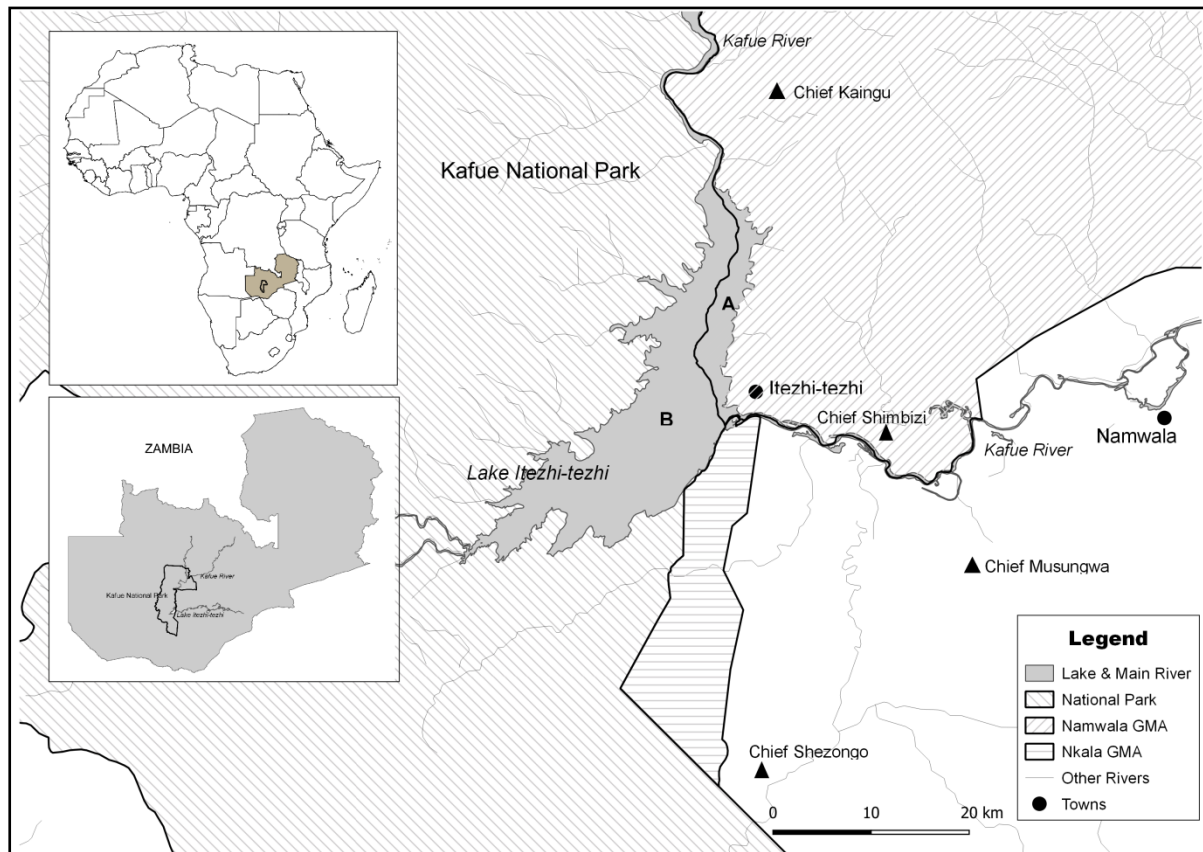


Figure 4.1: Map showing Lake Itzhi-Tezhi fishery, Kafue National Park, and Game Management Areas

Source: Author

4.2.2. Sustainable livelihood approach

This case study regarding Lake Itzhi-Tezhi fishery is framed under the Sustainable Livelihood Approach (SLA). The SLA fits well with organisations and interventions dealing with rural communities, like the Lake Itzhi-Tezhi fishing community, in developing countries and is attributed much to Robert Chambers' work on the 'wealth of the poor' and participatory methodologies (May et al., 2009). The SLA is mainly centred on wanting to understand how different people in different environments live, how and why they make the choices that they make concerning their livelihoods (Scoones, 1998; Levine, 2014). Various livelihood frameworks exist (see De Satgé, 2002), but the current study considered the Sustainable Livelihood Framework (Figure 4.2) by the Department for International

Development (DFID, 1999). This framework helps to understand the different aspects of local people's livelihoods holistically, that is, their assets or capital (human, natural, financial, physical and social capital) (Table 4.1), the influence of structures (organisations) and processes (institutions, rules, customs, laws, and culture), their vulnerability to different shocks, livelihood strategies employed to overcome them, and the livelihood objectives being pursued to enhance such livelihoods (Scoones, 1998).

The SLA has also been widely used as a framework and a guide for local, national and regional policy formulation concerning local fishing communities in addressing multiple livelihood issues, thereby promoting sustainable livelihoods and fisheries resource utilisation (Allison & Ellis, 2001; Allison & Horemans, 2006; Weeratunge et al., 2014; McClanahan et al., 2015). In this study, the SLA provides a methodological and analytical framework to show the influence of income from fishing on fishers' livelihood assets or capital, the impact of their vulnerability to various shocks, their livelihood coping strategies, and the implications of legislation and policy on such aspects and on the resources of the lake fishery.

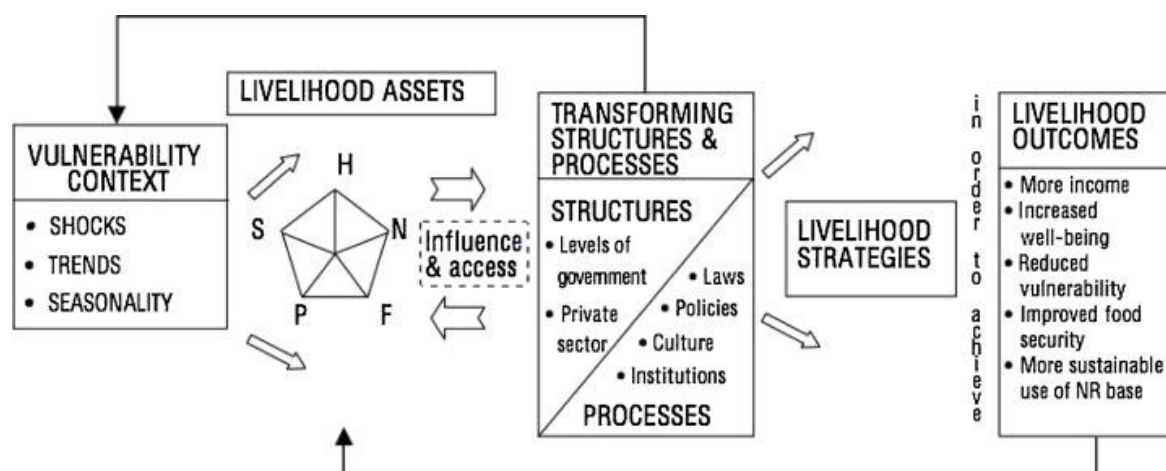


Figure 4.2: Sustainable Livelihood Framework

Source: Department for International Development (1999)

Table 4.1: Five livelihood assets or capital

Assets/Capital	Description
Human	Skills, knowledge, good health and ability to work that together enable fishers to pursue different livelihood strategies and achieve their livelihood objectives.
Social	Social resources which fishers can draw on including informal relationships of trust, reciprocity and exchange with families, friends and neighbours as well as more formalised groupings (e.g. community and faith groups).
Physical	Tools and equipment (fishing nets, canoes, and others.) that fishers need to be productive along with the necessary infrastructure needed to function, for example, affordable transport and energy, decent housing and access to information.
Financial	Earned income, pensions, savings, credit facilities, state benefits, child maintenance, and others.
Natural	Fish, soil, the weather, livestock, and crops which many poor fishers in developing countries rely on to produce their food and to gain an income.

Sources: Adapted from Department of International Development (1999) and May et al. (2009)

4.2.3. Data collection and analysis

4.2.3.1. *Sampling and data collection methods*

Data collection was conducted from March 2016 to July 2016 using a mixed-methods approach. Since the characteristics of fishers at Lake Itzhi-Tezhi and the set up of the fishery are heterogeneous in relation to distance and accessibility to the fishing sites from homesteads, a proportionate quota sampling method was used (Alvi, 2016). This type of sampling helped to determine relatively homogenous sample sizes of fishers from the 3 strata of the fishery that comprised fishing villages and fishing camps (See more details on sampling methods and strata formation in Chapter Three, Section 3.5).

A survey with mixed questionnaires, that is, questionnaires which comprised both closed-ended and open-ended questions, was used through which data regarding certain identified aspects of the fishing community were collected (Ghosh, 1992). A sample of 451 adult household heads (≥ 18 years old) were selected from the 3 strata with a total population of approximately 1800 fishers found in the 40 fishing camps and fishing villages. The selection of the fishers was conducted through a snowball sampling method (Alvi, 2016). A pilot study

using the designed questionnaire was done on one of the lake's fishing camps in order to pre-test the validity, reliability and practicality of the questionnaires (See more details on the survey with questionnaires in Chapter Three, Section 3.6.1).

The questionnaire focused on fishers' forms of livelihood assets or capital, incomes, expenditures, income sources, livelihood activities and income contributions of other household members, fish status in the fishery, accessibility to social amenities, livelihood strategies employed, fish market, and vulnerability of fishers.

Focus Group Discussions (FGD) were used because of the large amount of interaction and perceptions they can provide on a subject matter peculiar to the fishing community (Bless, Higson-Smith, & Sithole, 2013). Twelve FGDs from the 3 strata were purposefully selected because only 19 out of 40 fishing villages and fishing camps had fishers available at that time. Each FGD consisted between 8 and 12 purposefully selected adult respondents (≥ 18 years old) (Bless et al., 2013). In Stratum Three, 3 of the 4 FGDs had a mixture of men and women. However, an additional FGD was purposefully selected for women fish traders at Itzhi-Tezhi fishing harbour in order to capture their views (See more details on the formation of FGDs in Chapter Three, Section 3.6.2).

Semi-structured interviews were conducted with 15 participants from 11 stakeholders (organisations) and 2 key informants at the fishery in order to gather additional information on the subject and confirm earlier views gathered from FGDs (Bless et al., 2013). The stakeholders comprised the central government departments, local government, the District Commissioner's office officials, a Non-Governmental Organisation (NGO), private firms, traditional leaders. The ex-fishermen were the key informants. Purposive sampling was used to select the interviewees (See more details on the structuring of interviews in Chapter Three, Section 3.6.3).

The interviews and FGDs focused on the contribution of household members to household livelihoods, social relationships among different ethnic groups, levels of stakeholder support towards fishers' livelihoods, perceptions of the causes of the decline in fish catches, and the extent of fishers' vulnerability to shocks.

The household income recall period was every month over 1 year. For the performance and activities of the Fishermen and Fish Traders Association (FFTA) and other stakeholders, the recall period was 5 years. Regarding the fish catch status, the recall period was 5 to 10 years.

4.2.3.2. Data analysis

Qualitative data collected through the FGDs and interviews were analysed based on themed content analysis of transcribed scripts (Bless et al., 2013). Atlas.ti software was used for the analysis. Quantitative data collected through the questionnaires were analysed using descriptive and inferential statistics (Bless et al., 2013) with the aid of the Statistical Package for Social Sciences (SPSS) software version 20. Descriptive statistics (frequencies and percentages) were used to identify the main characteristics of the fishers. Inferential statistics were used to assess whether or not relationships existed between specific fishers' characteristics and fishing income. For instance, chi-square (Pearson's χ^2) and maximum likelihood (ML χ^2) coefficients together with Cramer's V (v) were used to determine the extent of associations between two nominal or ordinal variables (fishing income levels and other income sources) (McHugh, 2013).

Finally, ordinal logistic regression (OLR) predicted the extent to which the set of independent variables influenced the dependent variables (fishing income, expenditures, and physical assets) (Statistical Package for Social Sciences, 2008). A stepwise regression method was used in the analysis. The method is the step-by-step iterative construction of a regression model that involves the selection of independent variables to be used in a final model (Hayes, 2020). The method involves adding or removing potential explanatory variables in succession and testing for statistical significance after each iteration until the results are optimal (Hayes, 2020). Reliability and validity were addressed by the use of different sources of data (triangulation) (Kohn, 1997) and a stratified random sampling technique (Shi, 2015).

4.3. Results

4.3.1. Status of fishers' livelihood capital and fishing income contribution

4.3.1.1. *Human capital*

Regardless of the research strata, the fishing community was mostly composed of fishers who had not gone beyond primary education, who were married and who were within the age group of 18–40 years (Table 4.2). On average, each household had 4.5 members. The majority of fishers residing in the fishing villages and fishing camps of Lake Itzhi-Tezhi were migrants from other places within Zambia (Table 4.2). The majority of immigrants were in Strata Two and Three (i.e., 90% and 93% respectively), with Stratum One demonstrating 61% of immigrants.

Table 4.2: Characteristics of human assets in the fishing community (n = 451)

Human capital		% of fishers
Education level	None to completion of primary education	86
	Secondary to tertiary education	14
Marital status	Married	71
	Single	21
	Widowed, divorced	8
Age group	18–40 years	65
	Above 40 years	35
Residence status	Immigrant fisher	71
	Resident fisher	29

Source: Author's survey data

Of the 1 916 household members of fishers, 577 members (30.1%) were involved in fishing-related activities (Figure 4.3). Of these, 231 members (40%) were fish sellers only and 76 members (13.2%) were fish buyers-cum-fish sellers (Figure 4.4). However, of the 231 fish sellers and the 76 fish buyers-cum-fish sellers, 60.2% (139) fish sellers and 71.1% (54) fish buyers-cum-fish sellers were fishers' wives (Figure 4.4). The fishers' wives played a significant role in contributing to household income through fish selling. However, the FGDs revealed that most of the married fishers worked together as couples to earn their household income through fish trading.

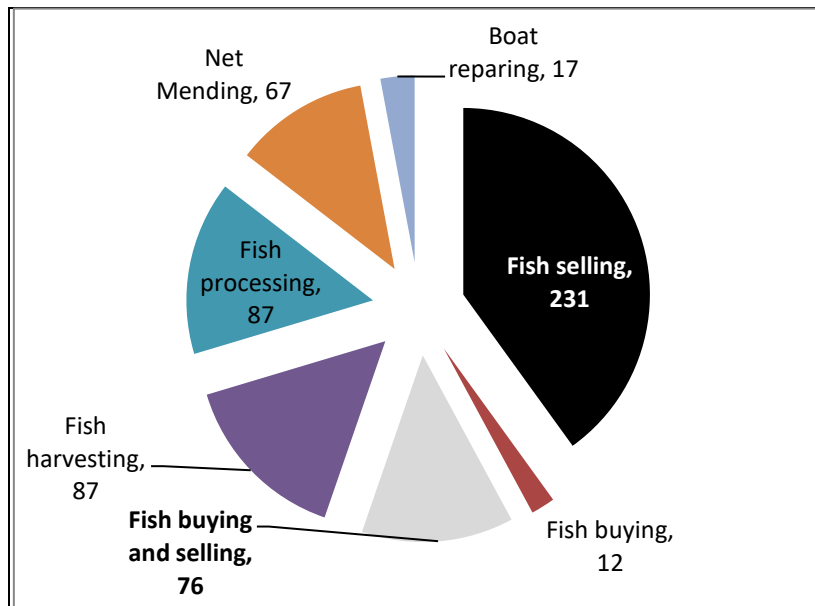


Figure 4.3: Number of household members involved in fishing-related activities (n=577)

Source: Author's survey data

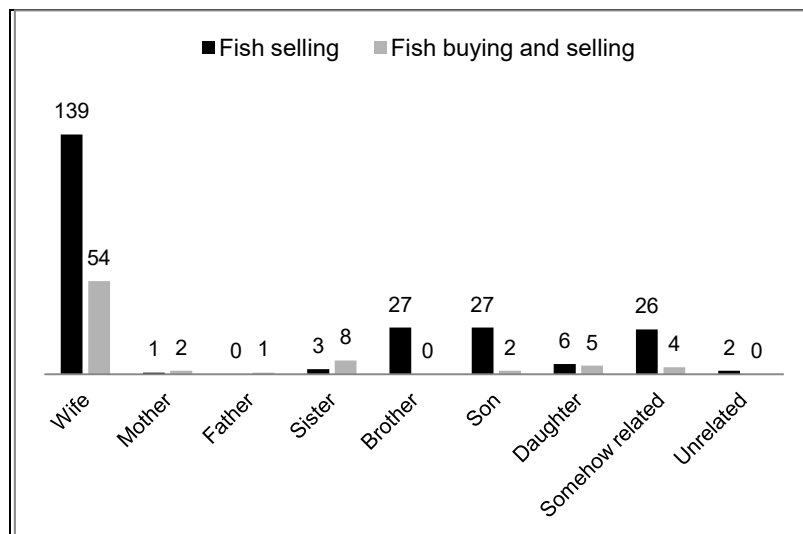


Figure 4.4 Number of fishers' household members involved in the fish selling business (n=231)

Source: Author's survey data

4.3.1.2. *Natural capital*

The survey revealed that 98% of all fishers in all the research strata depended on fish as a significant source of income, and 90% of fishers consumed fish daily. Seventy seven percent of fishers in all the strata used firewood as a source of energy for cooking. Sixty five percent of fishers in all the strata had access to pieces of land under the customary laws of land acquisition. Eighty percent of fishers in Strata One and Two had access to clean drinking water, but only 45% of fishers in Stratum Three had such access.

4.3.1.3. *Financial capital*

Fishing was the major source of income for fishers in all the research strata (Table 4.3). While controlling for research strata, the chi-square analysis showed that there was no significant association in the three research strata between income earned through fishing and income earned through each of the non-fishing activities, that is, crop production, livestock production, and others (Table 4.3). As such, income earned through fishing had no bearing on how non-fishing income was generated. Additionally, from the survey of the 274 fishers (60.7%) who had engaged in non-fishing income sources across all the strata, only 13.4% of the fishers confirmed earning income from crop production (maize and sweet potatoes) within the range of \$0.1–\$200 per year, 5.1% from livestock production (chickens) and 6.2% from additional income sources within the same range. The majority of the fishers felt that the contribution to the household income of these alternative sources of income was not significant compared with the income gained from fishing (Table 4.3).

Table 4.3: Percentages of fishers based on major income sources and income ranges. ^aSource include trading in non-fish items, charcoal, employment, and others (stone crushing, motor repairs, bricklaying)

Income Ranges	Major income sources (n=451)			
	Fishing Income/Month	Crop production Income/Year	Livestock production Income/Year	Other Income ^a /Year
0	0	39.2	60.8	39.5
\$0.1–\$100	30.6	10.2	4.9	5.5
\$100.1–\$200	26.6	3.2	0.2	0.7
More than \$200	42.8	3.5	0.4	2.3
Not sure	0	43.9	33.7	31.0
Total %	100	100	100	100

Source: Author's survey data

With regard to the 1916 fisher household members, 80.2% did not make any financial contribution to the household. This lack of contribution was because these members were too young or too old to work, or were pupils or students. Thus, only 19.8% contributed income through fish selling, self-employment, formal employment, and small grants from government, churches, and non-governmental organisations. In monetary terms, 7.2%, 6.1%, 3.7% and 2.8 % of the 1916 household members contributed less than \$50/month, \$50.1–\$100/month, \$100.1–\$200/month, and more than \$200/month respectively to household income.

The Ordinal Logistic Regression (Table 4.4) revealed that only the fishers' education levels and the location of their fishing areas influenced their fishing income levels. Fishers who were in research Strata One and Two tended to earn more income through fishing than those in Stratum Three. The scenario implies that Strata One and Two (comprising fishing camps with fishers focused on fishing alone) had most of the fishers who earned more than \$200/month compared with Stratum Three (comprising fishing villages with fishers also involved in other activities) who had most of the fishers who earned less than \$100/month. Furthermore, fishers who had some education (either primary or secondary education) tended to earn more fishing income than those who had no education (Table 4.4).

Table 4.4: Factors that influenced fishing income levels among fishers (n = 451; $R^2 = 0.06$; $p < 0.001$)

Variables	Parameter estimates		
	Estimate coefficient	Std. Error	P Value
Fishing income = Less than \$100	18.646	0.507	0.001
Fishing income = \$100.1–\$200	19.804	0.507	0.001
Education			
Some primary education	18.613	0.493	0.001
Completed primary education	19.268	0.507	0.001
Some secondary education	18.981	0.547	0.001
Completed secondary education	19.312	0.000	0.001
None	0 ^a	.	
Research Stratum			
One	0.791	0.237	0.001
Two	0.933	0.282	0.001
Three	0 ^a	.	

Source: Author's survey data

4.3.1.4. *Physical capital*

Fishers with less fishing income were more likely to own mud and thatched houses than fishers earning more fishing income (Table 4.4). As the fishing income of fishers increased, fishers were more likely to own unburnt and burnt brick houses with iron sheet roofs. Furthermore, fishers who earned a greater fishing income tended to own more fishing canoes and nets and household furniture and to possess solar panels for electrifying their homes, electronic information gadgets, and transportation vessels. However, fishing income made less than a 10.6% (R^2) statistically significant contribution to the regression model for all the physical assets under study (Table 4.5).

Table 4.5: Ordinal logistic regression prediction of whether or not fishers' ownership of physical assets was dependent on different levels of fishing income. Reference fishing income = more than \$200; n=451; * Significant (Sig.) at $p < 0.05$ or ** $p \geq 0.001$, ns: Not significant at $p \geq 0.05$

Fishers' physical assets	Fishing income	Estimate coefficient	Pseudo R^2
Mud and poles/thatched houses	Less than \$100	0.934**	0.042
	\$100.1–\$200	0.444ns	
Unburnt bricks/thatched houses	Less than \$100	0.212ns	-
	\$100.1–\$200	0.234ns	
Unburnt bricks/iron sheet roofed houses	Less than \$100	-0.725**	0.026
	\$100.1–\$200	-0.337ns	
Burnt bricks/iron sheet roofed houses	Less than \$100	-0.878*	0.022
	\$100.1–\$200	-0.148ns	
Cement blocks/iron sheet roofed houses	Less than \$100	-1.087ns	-
	\$100.1–\$200	-0.167ns	
Fishing nets	Less than \$100	-0.694**	0.028
	\$100.1–\$200	-0.716**	
Fishing canoes	Less than \$100	-1.032**	0.06
	\$100.1–\$200	-0.673**	
Bicycles	Less than \$100	-0.8**	0.045
	\$100.1–\$200	-0.782**	
Radios	Less than \$100	-0.782**	0.044
	\$100.1–\$200	-0.754**	
Cell phones	Less than \$100	-1.343**	0.105
	\$100.1–\$200	-1.017**	
Solar panels	Less than \$100	-0.745**	0.039
	\$100.1–\$200	-0.724**	
House tables	Less than \$100	-0.837**	0.058
	\$100.1–\$200	-0.93**	
House beds	Less than \$100	-0.89**	0.047
	\$100.1–\$200	-0.562*	

Source: Author's survey data

The survey showed that over 55% of the fishers in Strata One and Two had access to almost all social amenities, while less than 50% of fishers in Stratum Three did not have easy access to medical centres, clean drinking water, market centres, transport vessels, and reliable roads (Figure 4.5). Fishers in Stratum Three (FGDs) attributed their difficulty in accessing medical and market centres to the considerable distances of these facilities from their fishing villages. Unsafe drinking water from wells and the lake were the fishers' primary water sources in Stratum Three (FGDs). Poor access to vehicles (transport vessels) was attributed mainly to the poor road network (Figure 4.5).

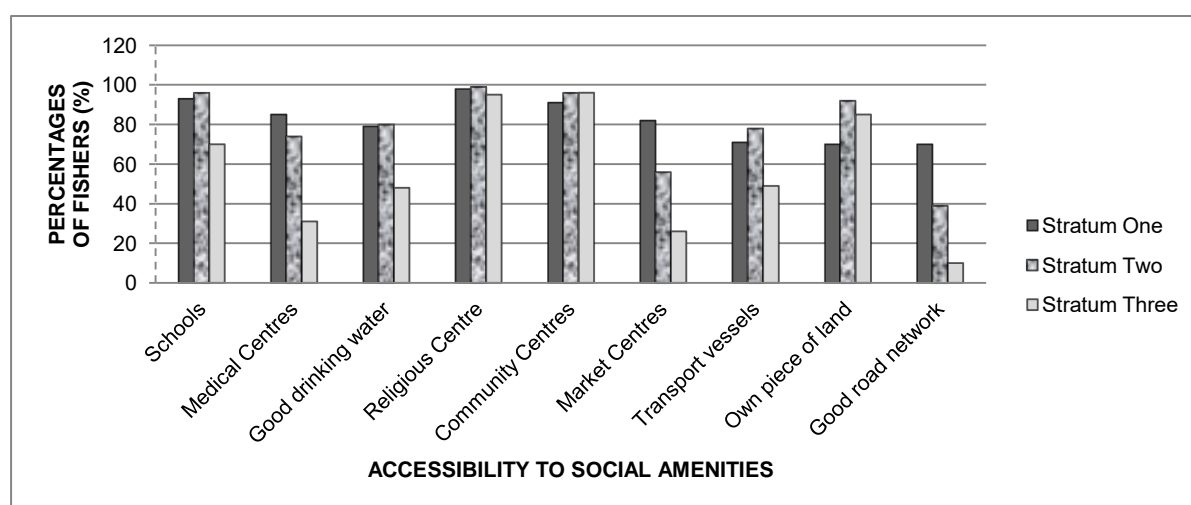


Figure 4.5: Percentages of fishers' accessibility to social amenities within Lake Itzhi-Tezhi fishing community in relation to research strata

Source: Author's survey data

4.3.1.5. Social capital

Despite fishers in all the strata indicating the availability of religious and community centres meant for developing the fishing community and improving people's livelihoods, participation at these centres was low (Figure 4.5). Of the 451 fishers surveyed, only 66 (14.6%) indicated being registered members of committees and associations available in the community. These institutions ranged from the FFTA to religious, political, educational, agricultural, traditional, youth, and village committees. Only 22 (4.9%) fishers surveyed were registered members of the FFTA, an association that deals with the welfare of all fishers who

trade on the lake. Low membership indicates that the majority of fishers are uninterested in the operations of the FFTA. The survey data was supported by the FGDs, indicating that the FFTA did very little to attend to fishers' livelihood needs.

Social interactions seemed to be lacking among the majority of fishers in the fishing community. However, results from both the FGDs and the survey indicated that regardless of ethnicity, there were cordial social relationships among the fishers while fishing.

4.3.2. Organisational (stakeholders) support

Of the 451 fishers surveyed, 74% considered the DoF to be mandated to govern and manage the fisheries' resources. However, FGDs in all the strata revealed that the DoF could not address their livelihood demands. The fishers in the FGDs also revealed that most of the other stakeholders had not offered the needed support to enhance their livelihoods in the fishing community. For instance, fishers indicated that they had no access to financial support in terms of loans from financial lending organisations or government to boost their other income-generation ventures. However, most of these organisations (stakeholders) contended that they did not provide much support because fishers seemed institutionally disorganised in their operations.

4.3.3. Vulnerability and livelihoods

4.3.3.1. *Vulnerability to food shortages and price fluctuations*

Regardless of the fishing income levels and the fishing locations, the survey showed the majority of fishers had experienced food shortages in the last twelve months (Figure 4.6). Eighty percent of the fishers further indicated that the food shortages occurred mostly during the months of January and February, which coincided with the closed fishing season. During this period, fishers' income was cut off, negatively affecting their food security and livelihoods. Additionally, income from fish sales was negatively affected by market prices during the fishing season due to the high supply of fish on the markets.

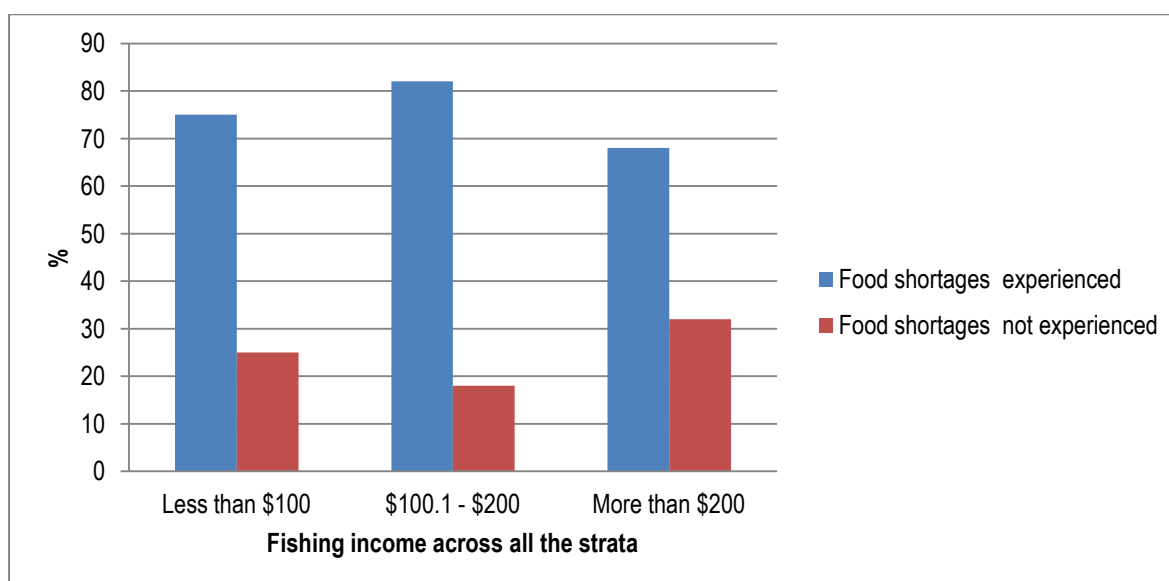


Figure 4.6: Food shortages experienced by fishers over the last 12 months in relation to their fishing income

4.3.3.2. Vulnerability to fishing duration and fish catches

Fishers currently take longer to meet their fishing target during the peak harvesting season than ten years ago (i.e. in 2006). Presently, reaching this fish catch target takes about 51 ± 25 days while ten years ago, it took about 20 ± 14 days. The increased fishing duration was attributed to low fish catches in the lake by 84% of fishers. Low fish catches were attributed to the high influx of fishers on the lake over the past five to ten years (FGDs in all strata). Headmen interviews suggested the influx of fishers came about because most village headmen allowed any Zambian fisher to settle in their villages; there were no severe restrictions for the settlement of fishers.

4.3.3.3. Vulnerability to other factors

From the survey of the 142 (31.5%) fishers-cum-crop farmers, 78.2% had their crop yields affected by inadequate or excessive rainfall over the past five years, and 47.2% had their crop yields affected by expensive inputs. In addition, of 169 (37.5%) fisher-cum-livestock farmers, 20.8% had their livestock production affected by disease outbreaks and 15.5% by predators. Almost half of the FGDs highlighted other significant shocks and stress such as exposure to

dangerous wild animals during fishing expeditions, fluctuations in fish catches due to hot and cold seasons, and high transport costs to fish markets.

4.3.4. Livelihood strategies and their impact

4.3.4.1. *Fish-selling locations*

Apart from being involved in crop and livestock production as livelihood strategies by a few fishers, selling fish in markets other than local markets to obtain a better price was a livelihood strategy. In all the strata, the majority of fishers with less fishing income preferred to sell their fish within Itezhi-Tezhi town, while those with a higher fishing income sold outside Itezhi-Tezhi town (Figure 4.6). Such preference in fish selling location, especially for Stratum Three, was reflected in the level of fishing income earned; 51% of fishers with a lower fishing income sold within Itezhi-Tezhi town compared with 25% of fishers with a higher fishing income. Only 14% of fishers with a lower fishing income sold outside Itezhi-Tezhi town compared with 88% of fishers with a higher income (Figure 4.6).

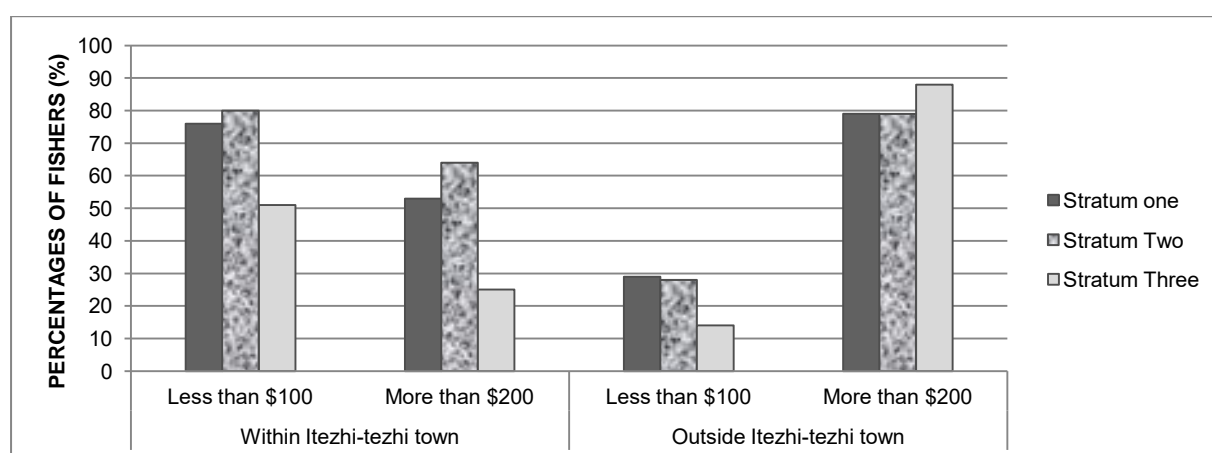


Figure 4.7: Preferred selling locations in relation to percentages of fishers' fishing income levels in each research stratum

Source: Author's survey data

4.3.4.2. *Strategic household expenditures*

The less the income of the fishers through fishing, the less fishers are likely to spend on foodstuff (Table 4.6). The low-income earners had fewer than three meals per day as a

livelihood coping strategy. In addition, less of the fishing income was spent on certain non-food goods and services such as school fees for children or relatives, transport, and energy sources (Table 4.6). However, fishing income only made less than a 3.3% (R^2) statistically significant contribution to the regression model for all the fishers' expenditure levels under study (Table 4.5).

Table 4.6: Ordinal logistic regression predictions of whether or not fishers' expenditures were dependent on different levels of fishing income. Reference for fishing income = more than \$200; n = 451; * Significant at $p < 0.05$ or ** $p < 0.001$, ns: Not significant at $p \geq 0.05$

Expenditures	Fishing income	Estimate coefficient	Pseudo R^2
Expenditure on food stuffs	Less than \$100	-0.714**	0.032
	\$100.1–\$200	-0.587**	
Expenditure on medication	Less than \$100	0.137 ns	-
	\$100.1–\$200	0.117 ns	
Expenditure on school fees	Less than \$100	-0.671**	0.03
	\$100.1–\$200	-0.522*	
Expenditure on transport and energy sources	Less than \$100	-0.709**	0.032
	\$100.1–\$200	-0.592*	
Expenditure on alcohol and beverages	Less than \$100	-0.346 ns	-
	\$100.1–\$200	-0.136 ns	

Source: Author's survey data

4.4. Discussion and conclusion

4.4.1. Income and livelihood assets

In many African countries, inland small-scale fishing contributes to fishers' livelihoods. Small-scale fishing provides income to access goods and services such as food, health, education, clothing, fishing inputs, and agricultural labour (Béné & Heck, 2005; Béné et al., 2009; Welcomme et al., 2010). The current study confirmed this view and demonstrated that income from fishing had a bearing on the fishers' livelihoods depending on the levels of income earned. The higher the income through fishing, the more it empowered fishers to invest in several physical assets (capital) and to access goods and services for their households. This study also showed that fishing income alone was not enough to enhance

fishers' livelihoods. In addition, other factors such as the vulnerability of fishers to various shocks and stress affected their livelihoods.

Education level seems to be one of the aspects that are critical in influencing the level of fishing income. This study indicated that fishers with a relatively higher education earned a greater fishing income per month. This scenario reinforces the need for education through consistent awareness-raising and capacity-building programmes organised by stakeholders (Allison & Horemans, 2006; FAO, 2015) to empower fishers with knowledge and skills. Capacity-building programmes could range from financial and business management to sustainable fishing techniques.

The current study agrees with the studies of Ngoma (2010) and Sililo (2016) conducted on the Kafue floodplain fishery in Zambia that showed that immigration of fishers from other parts of Zambia contributed to the reduction in fish catches per fisher. In the current study, low fishing income was also attributed to the influx of immigrants. A review of certain African and Asian fisheries by Béné (2003) and a study of West African fisheries by Binet et al. (2012) also showed that migration of fishers into fisheries was a common problem that usually resulted in overexploitation of fisheries' resources and a negative impact on the livelihoods of the local fishing communities.

The low fish catches experienced by the Itezhi-Tezhi fishers seemed to have limited the fishers' ability to earn more income for further investments and to meet household needs. The other sources of income did not contribute sufficiently to total household income, and this was attributed to a lack of stakeholders' support in making these alternative sources viable. Regarding the presence of stakeholder support as recommended by the FAO (2015) in its voluntary guidelines for securing sustainable small-scale fisheries, the current study concurs and states that sustained technical and financial support for fishers by identified stakeholders at Lake Itezhi-Tezhi fishery is crucial. Such support would enhance fishers' crop and livestock production and other business ventures, thereby improving their income levels.

Another aspect is the role of women in income contribution to household food security and income through fish trading (Kleiber et al., 2015; Harper et al., 2017). The current study argues that if local women were empowered by formalising their fish trading through a deliberate policy framework, they would exert a more positive impact on the livelihoods of their households. Policy-driven fish trading for women would perhaps help them to access

credit facilities to venture into new businesses, resulting in more income for household use. Huchzermeyer (2013) alluded to the same in his study on the fishery at Lake Bangweulu floodplain in Zambia although the focus in the research was on local fish traders regardless of gender.

4.4.2. Vulnerability, governance, legislation, and policy

Vulnerability incorporates exposure to shocks, stress, risks, and susceptibility (Béné, 2009). Also, exposure to vulnerability among fishers are different from one fishery to another (Adger et al., 2004). In the current study, fishers were exposed to crop and livestock production failures, a closed fishing season of three months (fishing ban), fluctuating fish catches due to changes in yearly seasons, and high transport costs to distant markets, of which negatively affected their livelihoods at household level. The closed fishing season demonstrated a greater negative impact on the fishers since it usually coincided with their low or absent crop and livestock production. The few fishers with higher fishing income and stable alternative sources of income could have been less vulnerable to these shocks and stress, but the study showed that the majority of the fishers were more vulnerable to them at household level.

The impact of vulnerability on small-scale fishers was also reported by Allison and Ellis (2001), Béné (2009), and Ngoma (2010) who associated higher reliance on a single source of income such as fishing with higher vulnerability to risks and poverty, particularly in poor households. In agreement with the argument of Belhabib et al. (2015), the extent of most fishers' vulnerability in the current study seemed to have contributed to fishing being a last resort activity rather than a source of sustainable livelihood.

Furthermore, the external factors of vulnerability to which fishers were exposed are firstly, the lack of stakeholder support towards alternative livelihood strategies causing the majority of fishers' failure to productively engage themselves in other sources of income. Secondly, the increase in immigrant fishers who contributed to the overexploitation of the fisheries resources, hence the low fish catches that were being experienced. Thirdly, the lack of fisheries' policy in the governance of the fishery could be an additional factor. The absence of this policy seems to have created a gap in providing specific direction on how fishers' livelihood needs could be addressed through the governance process of the fishery.

Solving the problem of immigration was elusive in the current study at both local and national levels. There has been no enforcement of appropriate legislation and customary laws by local authorities and traditional leaders respectively to minimise the influx of immigrant fishers simply because everyone is considered a Zambian citizen with the liberty to settle anywhere. Njock and Westlund (2008) argue that internal migration and the transboundary migration of fishers usually in search of better livelihoods and fish stock abundance is a global phenomenon. As such, the United Nations Development Programme through the 2030 Sustainable Development Goals (UNDP, 2015) and the International Organisation for Migration (IOM, 2010) have been advocating the creation of migration policies and ratification of conventions and protocols by member countries in order to protect the rights and privileges of all migrants. The SDG 10 in particular focuses on facilitating responsible migration of people through the implementation of planned and well-managed migration policies. For Lake Itzhi-Tezhi fishery, this is one aspect in which stakeholders can engage the central government and the local government to adopt adequate policy interventions to increase the positive impacts and decrease the negative impacts of immigrant fishers on the resources of the fishery.

The majority of the fishers in this study also showed apathy, not only to social asset-enhancing community groupings but also to the operations of their association (the FFTA). However, their apathy towards the FFTA was primarily due to the association's weak local governance approach that prevented fishers' participation and failed to meet the livelihood needs of the fishers. The study of Lundström and Nordlund (2016) reveals that proper participation of local fishers in the co-management governance of fisheries resulted in positive socio-economic effects on the fishers of Ggaba, Uganda. A stronger local governance structure is, therefore, required for the Lake Itzhi-Tezhi fishery.

Despite the apathy, there was a cordial, social cohesion among the fishers in this study that enabled them to work together outside the FFTA and helped to mitigate the impact of vulnerability to which they were exposed in relation to their fishing business. Such cohesion indicates that there is a possibility for a healthy and inclusive governance structure through the FFTA to help address the challenge of vulnerability. The potential of such social cohesion in collaborative local governance was also highlighted by Nunan et al. (2018) in her study on Lake Victoria fishing communities. Allison and Horemans (2006) and Sulu et al. (2015) also

confirm that a reliable local governance approach in fishing-dependent fisheries is critical for attending to fishers' vulnerability and livelihood assets.

4.4.3. Livelihood strategies of fishers and impact on livelihoods

Some fishers in the current study attempted various livelihood strategies beyond fishing as additional income sources, primarily crop and livestock production. However, there was little or no success in crop and livestock production due to drought, floods, expensive inputs, and livestock diseases. As such, the income levels and the livelihoods of the fishers were negatively affected.

Besides, the small town of Itezhi-Tezhi did not have many employment opportunities (DoF, 2014b). Béné (2006) argues that the high dependence on fishing income by fishers may be because other employment options with higher returns are not available to them. Therefore, the level of unemployment in Itezhi-Tezhi district further explains the influx of people into fishing and fish trading around the fishery and the resultant negative impact on livelihoods.

Alternative livelihood strategies enable fishers' households to become involved in different economic sectors, thus cushioning the effects of variations in fisheries' resources (Charles, 2011). Involvement in alternative livelihood strategies seemed to be the way forward for the Lake Itezhi-Tezhi fishers since fishing income was no longer dependable. However, support from the fishery's stakeholders towards such strategies was needed. This study revealed that the lack of stakeholders' support was partly because fishers and the FFTA leadership were perceived to be too institutionally disorganised to warrant such support. As such, there is a need for fishers to cultivate stronger collaborations with other stakeholders in order to attract their expertise and resources and help boost alternative income sources as was demonstrated by small-scale fishers and the government on Lake Chiuta, Malawi (Donda, 2017).

4.5. Conclusion

Based on the Sustainable Livelihood Approach, the findings of this study revealed that the dynamic, small-scale Lake Itezhi-Tezhi fishery requires a holistic and multi-sectoral approach to address the livelihood needs and challenges of the fishers' households and to achieve livelihood sustainability. To enhance the livelihoods of the households of small-scale

fishers at Lake Itzhi-Tezhi fishery, this study suggests the following strategies: (a) support of fishery stakeholders towards alternative income sources; (b) development of a legally mandated local governance system to meet livelihood needs; (c) development or adoption of fisheries-related migration policies and strengthening of customary laws to minimise the negative impact of immigrant fishers; and (d) development of a livelihood-inclusive fisheries policy framework. The outcome of these strategies may also help to reduce pressure on the resources of the Lake Itzhi-Tezhi fishery and enhance the sustainable use of these resources.

Beyond Lake Itzhi-Tezhi fishery, this study contributes lessons to the small-scale inland fishing and livelihoods debate. The study highlights the need for the development or enactment of the right livelihood-tailored fisheries policies and legislative frameworks that would compel the engagement and incorporation of appropriate stakeholders in fishers' livelihoods and sustainable fishing, besides the government. These policies and legislative frameworks should be developed or revised and strictly adhered to by all stakeholders concerned.

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Chapter 5.

Governance Assessment of Small-Scale Fishing on a Small-Scale Lake Fishery⁸

Abstract

The small-scale fishing sector in sub-Saharan Africa is experiencing multiple challenges, mainly related to various governance issues. This study assessed the governance approach at a small-scale Lake Itzhi-Tezhi fishery, Zambia and how it relates to sustainable fishing. Data were collected through a mixed-methods approach. The governance approach was assessed by legitimacy criterion. The study revealed that there was no co-management in place but a dual governance approach - fishing community-based approach and central government-controlled approach. Both were ineffective, mainly due to lack of adherence to the legislation for local community participation in fisheries governance and an inadequate policy framework to guide the governance process. Also, the governance approaches lacked legitimacy with stakeholders. As such, unsustainable fishing practices had continued. To move towards sustainable fishing at the fishery, the study suggested the following measures: active stakeholders' collaboration and engagement with the government for prompt implementation of legislation that promotes active local fishers' participation; establishment of an appropriate fisheries policy; and ultimately, a transformation of the current governance approach into a legitimate co-management governance approach. These suggested recommendations might be useful to other African small-scale inland fisheries with similar governance challenges, and also towards meeting Sustainable Development Goal 14 on sustainable fishing.

Keywords: fishers, fisheries co-management, legitimacy, legislation, stakeholders, sustainable

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5.1. Introduction

In Africa, the small-scale inland fisheries sector plays a significant role in providing employment, income, nutrition and food security, especially among local fishing populations (Weeratunge et al., 2014; Welcomme et al., 2010;). The sector has, however, experienced multiple challenges, including unsustainable fishing practices and overexploitation of fisheries' resources (Welcomme et al., 2010; Ogello et al., 2013; Food and Agriculture Organisation, 2015) and these have largely been attributed to weak governance (Carbonetti et al., 2014). Weak governance of the small-scale inland fisheries has been due to several factors, such as low participation of local fishing communities (Ogello et al., 2013; Lawrence, 2015), limited extension services (Béné et al., 2009), inappropriate fisheries laws (Ogutu-Ohwayo & Balirwa, 2006), inadequate law enforcement (Ogutu-Ohwayo and Balirwa, 2006; Béné et al., 2009), weak institutions and institutional processes (Ogutu-Ohwayo and Balirwa, 2006; Béné et al., 2009), lack of political will (Carbonetti et al., 2014), and insufficient funds for implementing fisheries programmes (Ogutu-Ohwayo and Balirwa, 2006; Nunan, 2010).

Graham et al., (2003:2) define governance as “interactions among structures, processes and traditions that determine how power and responsibilities are exercised, how decisions are taken, and how citizens have their say”. Vatn (2015) relates these governance structures and processes to how priorities are shaped, how conflicts are resolved, and how the coordination of peoples' actions regarding fishing is facilitated. Governance in fisheries guarantees outcomes such as the development of policy and regulatory frameworks (Njaya et al., 2012), connection of government with other stakeholders (Nunan, 2010), legitimation, balancing of stakeholders' interaction, and enforcement of decisions and regulations (Béné et al., 2009), reduction in conflict among stakeholders (Mcclanahan et al., 2015), and conditioning of the allocation of power, resources and benefits (Béné et al., 2009; Nunan, 2010). Various governance approaches (See Pomeroy and Rivera-Guieb, 2006) that enhance the highlighted governance outcomes in promoting sustainable fishing practices, among other aspects, have been employed over the years. However, of these governance approaches, co-management has been promoted as the most appropriate approach to the governance of inland fisheries in most African countries since the late 1980s (Lewins et al., 2014).

Co-management is a governance approach that has widely replaced the often unsuccessful central government governance approach to the management of inland fisheries in most sub-Saharan African countries (Béné et al., 2008; Lawrence, 2015; Nunan et al., 2015). It can be understood as “a partnership arrangement in which the community of local resource users, government, other stakeholders, and external agents share the responsibility and authority for the management of the fishery” (Pomeroy & Rivera-Guieb, 2006:7). Nevertheless, the co-management governance approach has been challenging to implement and has not performed as expected in most sub-Saharan African inland fisheries (Welcomme et al., 2010; Ogello et al., 2013). One of the primary reasons is that the initiators of this approach have often been governments. These governments have not been willing to decentralise power, authority and responsibilities to local fishing communities and other stakeholders as required by relevant national legislation (Béné et al., 2008; Lawrence, 2015). This scenario has resulted in continued reports of unsustainable fishing practices (seine nets, unapproved mesh-sized nets, fish poisoning, etc) and declines in fish catches (Welcomme et al., 2010; Ogello et al., 2013; Food and Agriculture Organisation, 2015; Haambiya et al., 2015), hence the need for further assessments of the fisheries governance process.

It has been observed that approaches to governance, as in the case of co-management, usually raise conceptual and practical challenges in developing appropriate processes that are responsive, accord power-sharing, and can draw and act on multiple sources of knowledge (Nunan, 2010). As a result, assessing the governability of a specific fishery is usually helpful in identifying constraints on effective governance and improvements required in the governance process (Béné et al., 2009; Nunan, 2010).

This study aims at contributing to the understanding of the governance of African small-scale inland fisheries in relation to sustainable fishing practices. The study has considered Zambia, a country that is in the process of re-establishing co-management on her inland fisheries, and selected a small-scale Lake Itzhi-Tezhi fishery as a case. Therefore, this study focuses on assessing and analysing the current governance approach at the lake fishery and the sustainability of fishing practices. This assessment helped to make appropriate recommendations towards the Zambian co-management process in particular and the sub-Saharan Africa inland fisheries in general. The following research questions guided the analysis of the current fisheries governance approach:

- i. What are the roles of the different stakeholders under the current governance approach in relation to sustainable fishing practices?
- ii. How do the different stakeholders perceive the legitimacy of the current governance approach and the challenges experienced in its execution towards sustainable fishing practices?
- iii. What has been the impact of legislation and policy on the governance approach and sustainable fishing practices, and how can that guide the way forward?

5.2. Zambia's fisheries governance, legislation and policy

A formal regulatory framework for the governance of fisheries started with the Fish Conservation Ordinance of 1925 and was closely linked to the Game laws of Zambia, which was then under colonial rule. During this period, traditional authorities had some control among their subjects as regards fishing methods and gear used, and this helped to mitigate overfishing (Government of Zambia, 2007). The fisheries sector's link to Game laws was changed in 1943 when the Fish Control Regulations Act was enacted to specifically regulate the fisheries sector. The Fish Control Regulation Act was, however, replaced by the Fish Conservation Ordinance of 1962, which included additional pieces of legislation (Mudenda, 2009). After independence, Zambia got its own fisheries legislation, the Fisheries Act (200 of 1974) (Government of Zambia, 2010).

Through these legislative frameworks, the Zambian fisheries sector has been governed primarily by the central government, with focus mainly on capture fisheries management (including yearly fish stock assessments) and conservation. However, over the years, this governance approach has failed to achieve sustainable fishing due to various reasons, such as fishing without a license, fishing during the closed fishing season, and using illegal fishing methods and gear (Haambiya et al., 2015).

Unsustainable fishing of fisheries resources compelled the government to amend the Fisheries Act (200 of 1974) (Government of Zambia, 2010) in 2007. The amendment led to the enactment of the Fisheries Act (22 of 2011) (Government of Zambia, 2011). The Fisheries Act of 2011 was, among other aspects, meant to empower the local fishing

communities to participate in fisheries governance through the formation of Fisheries Management Committees (FMCs). To achieve this, the Fisheries Act (22 of 2011) (Government of Zambia, 2011) mandates the FMC to comprise 6 persons from the local fishing community and at least 7 stakeholders for the governance and management of a given fishery or part of a fishery, as stated below.

“The Minister may, by a statutory instrument, appoint a [Fisheries Management] Committee for a fisheries management area [fishery].... The Committee appointed shall comprise 6 representatives from the local riparian fishing community who shall be elected by the local community.... The functions of the Committee are to promote and develop an integrated approach to the management and sustainable utilisation of natural and fisheries resources in a fisheries management area under its jurisdiction” (Fisheries Act of 2011, Part 4, Sections 29 and 30) (Government of Zambia, 2011).

As regards a policy framework, a fisheries policy to guide the governance of small-scale fisheries has never been developed. Nevertheless, the Department of Fisheries (DoF) adopted the National Agriculture Policy (NAP) (2012–2030) as a policy for promoting sustainable management of fisheries resources (Government of Zambia, 2016).

At the fishing community level, fishers have been forming their associations to help in fisheries governance and in meeting their livelihood needs. One such example is the Fishermen and Fish Traders Association (FFTA) at Lake Itzhi-Tezhi. This association is registered with the Registrar of Societies but is not connected in any way to the FMC. Despite the changes made to legislation in 2011 and the adoption of the NAP in 2012, reports of unsustainable fishing practices have continued in many fisheries (Department of Fisheries, 2014a).

5.3. Methodology

5.3.1. Governance assessment

In order to assess the current governance of Lake Itzhi-Tezhi fishery, the criterion of

legitimacy was employed (Vatn, 2015). There are various forms of legitimacy (Bäckstrand, 2006), but this study adopted a twofold system, that is, input and output legitimacy (Table 5.1). Input legitimacy highlights indicators such as participation of various stakeholders in the decision-making process, transparency of the process and accountability of decision-makers (Scharpf, 2001, Vatn, 2015). Output legitimacy, however, is about the fairness in the distribution of benefits and burdens across activities in society in addition to the effectiveness of the outcomes (capacity based on the policy for ensuring that the defined goals are reached) and the efficiency of the outcomes (ability to reach set goals at lowest cost) (Scharpf, 2001, Vatn 2015). In a governance system, input legitimacy has any influence on output legitimacy and vice versa (Bäckstrand, 2006).

Assessing and analysing the fisheries governance based on these legitimacy indicators provides useful insights into both the performance of participants in the governance of fisheries' resources and its outcomes (Lawrence, 2015; Vatn, 2015). The legitimacy criterion also allows for assessing the extent of benefit and burden-sharing in fisheries resource governance between the government and the local fishing community, a critical aspect if the governance that incorporates the local fishing community should be enhanced and sustained (Béné et al., 2008; Food and Agriculture Organisation, 2015).

Table 5.1: Legitimacy types and indicators and stakeholders' perceptions of legitimacy indicators

Serial No.	Type of legitimacy	Legitimacy indicator	Stakeholders' perceptions of legitimacy indicators
1	Input	Accountability	<ul style="list-style-type: none"> • Accountability for utilisation of funds by association • Knowledge of accountability for funds at the DoF • Accountability of association leaders regarding the constitution's requirements
2	Input	Transparency	<ul style="list-style-type: none"> • Flow of information to fishers⁹ on sustainable fishing practices • Flow of information to stakeholders on the use of funds by the FFTA leadership and the DoF

⁹ All those who directly derive a livelihood from fishing and related activities (e.g. fish trading) (Lenselink, 2002)

			<ul style="list-style-type: none"> Stakeholders' awareness of the association's constitution Stakeholders' access to the contents of the association's constitution
3	Input	Participation	<ul style="list-style-type: none"> Stakeholders' attendance of meetings and involvement in decisions-making Fishers' contributions to association membership fees Fishers' participation in association elections Stakeholders' participation in promotion of sustainable fishing practices Stakeholders' participation in enforcement of fishing regulations
1	Output	Effectiveness	<ul style="list-style-type: none"> Capacity of FFTA to promote the use of sustainable fishing practices Capacity of the DoF to enforce fishing regulations Capacity of all other stakeholders to assist in enforcing fishing regulations
2	Output	Benefit and burden sharing	<ul style="list-style-type: none"> Sharing of benefits from the lake's resources through the FFTA and DoF Sharing of burdens in the fishing business through the FFTA and DoF Sharing of burdens among fishers and other stakeholders in fishers' fishing businesses

FFTA: Fishermen and Fish Traders Association; DoF: Department of Fisheries

Source: Adapted from Vatn (2015)

5.3.2. Study site

The site for this study was Lake Itezhi-Tezhi fishery. Lake Itezhi-Tezhi is a man-made lake created by a dam wall on the Kafue River in the Central Province of Zambia (Figure 5.1). The dam was meant as water storage for hydro power production by the Kafue Gorge Upper Power Station that is located about 260 km downstream (Mbewe, 2000).

The lake lies within the Itezhi-Tezhi District (Figure 5.1). The district had the fastest growing population in the Southern Province of Zambia and demonstrated an average population growth of 4.8% per annum in the 2000–2010 intercensal period (Central Statistics Office, 2014). The fishing community under study comprised fishers who reside in the chiefdoms of four prominent chiefs, namely Kaingu (northern side of the lake), Musungwa and Shimbizi (eastern side of the lake) and Shezongo (southern side of the lake) (Figure 5.1). The residents of these chiefdoms are under the authority of the chiefs and their headmen.

A large portion (B) of the lake lies in the Kafue National Park, a government property (Figure 5.1). Due to this dual setting and based on the Wildlife Act (14 of 2015) (Government of Zambia, 2015) and the Fisheries Act (22 of 2011) (Government of Zambia, 2011), it is a joint mandate of the Department of National Parks and Wildlife (DNPW) and the Department of Fisheries (DoF) to govern and manage the resources of the lake fishery.

Fishers are authorised to enter the park to fish on the lake during the fishing season (March to November) through park entry permits issued by the DNPW and fishing licences issued by the DoF. Every year, the Fisheries Act (22 of 2011) (Government of Zambia, 2011) mandates the DoF to enforce a ban on fishing during the three months of the closed fishing season (December to February) (Department of Fisheries, 2014b) (See more details on the study site in Chapter Three, Section 3.9).

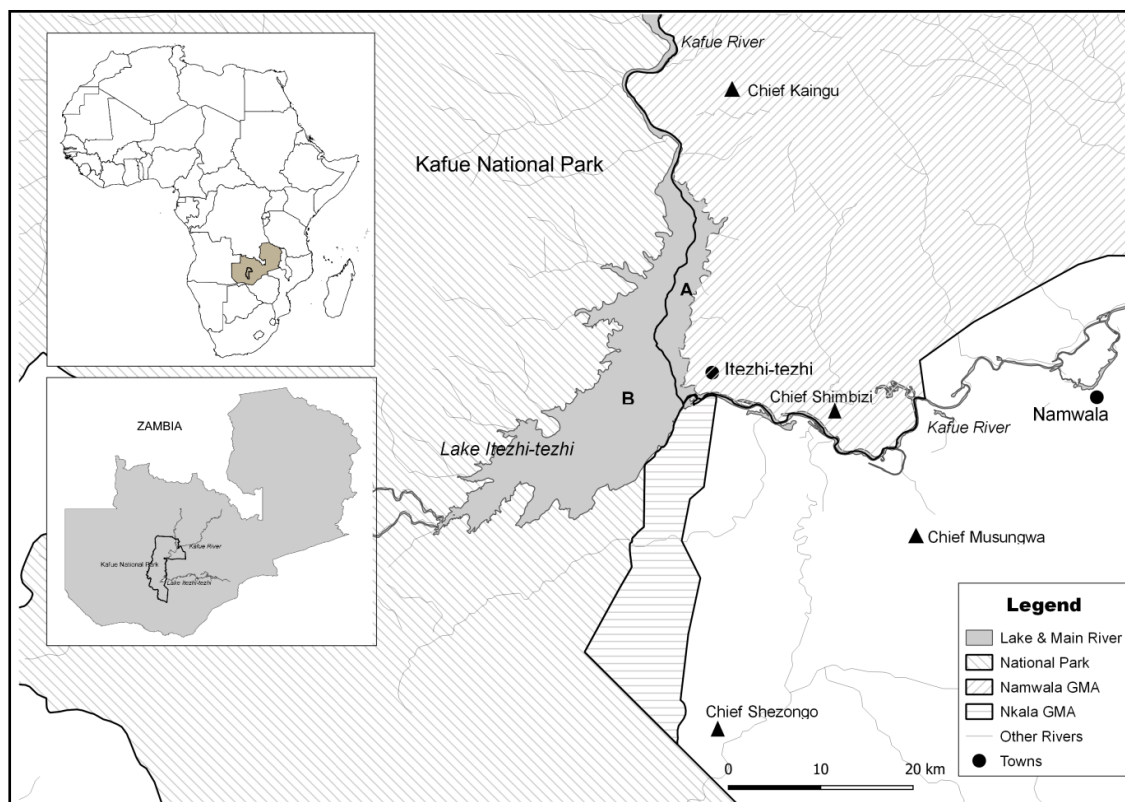


Figure 5.1: Map showing Lake Itzhi-Tezhi fishery, Kafue National Park and Game Management Areas

Source: Author

5.3.3. Data collection and analysis

Data collection was conducted from March 2016 to July 2016 using a mixed-methods approach. Since the characteristics of fishers at Lake Itzhi-Tezhi and the set up of the fishery are heterogeneous in relation to distance and accessibility to the fishing sites from homesteads, a proportionate quota sampling methods was used (Alvi, 2016). The type of sampling helped to determine relatively homogenous sample sizes of fishers from 3 strata of the fishery that comprised fishing villages and fishing camps (See more details on sampling methods and strata formation in Chapter Three, Section 3.5).

A survey using mixed questionnaires, that is, questionnaires which comprised both closed-ended and open-ended questions (Bless et al., 2013), was conducted through which data regarding certain identified aspects of the fishing community were collected. A snowball sampling method (Alvi, 2016) was used in each selected fishing camp or fishing village within each stratum to select the required number of fishers. A sample of 451 adult household fishers (≥ 18 years old) was determined from a total of 1800 fishers in the 3 strata. As regards fishing camps and fishing villages, a total of 12 out of 40 of fishing camps and fishing villages. A pilot study using 20 questionnaires was conducted on the same fishers in order to pre-test the suitability, validity and applicability of the instrument (Babbie & Mouton, 2001). The questionnaire focused on the following aspects: the demographic profile of the fisher; the fisher's perceptions of programmes regarding sustainable fishing practices and the status of fish in the lake; and the fishers' perceptions about other stakeholders and their roles at the fishery. (See more details on the survey with questionnaires in Chapter Three, Section 3.6.1).

Twelve FGDs from the 3 strata were purposively selected because only 19 fishing villages and fishing camps had fishers available at that time. Each FGD consisted of about 10 purposefully selected adult participants (≥ 18 years old) (Bless, Higson-Smith, & Sithole, 2013). In Stratum Three, 3 of the 4 FGDs were composed of men and women and one was for women fish traders outside the strata (See more details on the formation of FGDs in Chapter Three, Section 3.6.2).

Semi-structured interviews with key stakeholders were conducted and 17 interviewees were purposefully sampled. The overarching themes for the interviews and the FGDs were the

roles of various stakeholders in the fishery and their perceptions of legitimacy indicators (Table 5.1) in relation to governance aspects and use of the fishery's resources (See more details on the structuring of interviews in Chapter Three, Section 3.6.3).

Qualitative data collected through FGDs and interviews were analysed by developing themes and sub-themes on transcribed scripts in line with the research questions. The themes and sub-themes were then linked to participants' perspective codes that were either quantified or used in their raw form during the analysis process (Babbie & Mouton, 2001). Quantitative data collected through questionnaires were analysed using the Statistical Package for Social Sciences (SPSS) software (IBM-Corp., 2011). Descriptive statistics were used to compute frequencies and percentages of various variables captured through the questionnaires. Reliability and validity were addressed by using different sources of data and the quota sampling technique (Kohn, 1997; Bless et al., 2013).

5.4. Results

5.4.1. Demographic profile of Lake Itzhi-Tezhi fishers

The demographic profile shows, primarily, the composition of fishers at Lake Itzhi-Tezhi fishery that responded to various questions for this study. Of the 71% immigrant fishers sampled, the majority of them originated from North-western (Luvala), Western (Lozi) and Luapula provinces (Bemba) of the country (Table 5.2) in search of a source of livelihood. Seventy-eight (78%) of these immigrant fishers had permanently settled in the fishing community, while 22% had homes elsewhere and were there temporarily (Table 5.2). Focus group discussions and interviews with headmen and key informants revealed that most of the immigrants were already fishers from their areas of origin. The actual indigenes, the Ila, comprised only 8% of the sample. The majority of fishers (65%) were relatively young (18–40 years), mostly with only primary education or less (86%). From the sample of fishers, 98% depended on fishing for their livelihoods (Table 5.2).

Table 5.2: Prominent demographic characteristics of 451 sampled fishers in the Lake Itzhi-Tezhi fishing community

Demographic profile of fishers		%
Education level	Primary education completed or below	86
	Secondary education not completed	10
	Secondary education completed	4
Marital status	Married	71
	Single	21
	Widowed, divorced	8
Age group	18–40 years	65
	Above 40 years	35
Ethnic group	Lozi	31
	Luvale	23
	Bemba	19
	Nkoya	9
	Ila	8
	Other	10
Residence status	Immigrant fisher	71
	Resident fisher	29
Major source of income	Fishing	98
	Other	2

Source: Authors

5.4.2. Legitimacy of governance approaches and challenges

Interviews and FGDs revealed two governance approaches on the lake; central government-controlled governance through the DoF and fishing community-based governance through the FFTA. These approaches worked independently of each other. My analysis of how the stakeholders perceive the legitimacy of the governance approaches is presented in the following three sub-sections.

5.4.2.1. *Fishing community-based governance approach: Fishermen and Fish Traders Association*

This governance approach was centred on the FFTA whose members were mainly fishers and fish traders at Lake Itzhi-Tezhi. According to the FFTA constitution, its function was primarily to promote the welfare of its members. Its members constitutionally elected the FFTA leaders.

Table 5.3: Fishers' awareness of the existence of the Fishermen and Fish Traders Association in the fishing community

Research strata	Fishers' awareness of the existence of Fishermen and Fish Traders Association in fishing community (counts)		Total
	Aware	Not aware	
Stratum One	145	121	266
Stratum Two	50	51	101
Stratum Three	42	42	84
Awareness level	237 (52%)	214 (48%)	451

Source: Author's survey data

However, of the 451 fishers surveyed, only 52% were aware of the existence of the FFTA (Table 5.3). In each stratum, about 50% of fishers were aware of its existence (Table 5.3). The legitimacy indicators captured through the surveys applied only to those who were aware of the FFTA.

Accountability

Of the 237 fishers who were aware of the existence of the FFTA (Table 5.3), 58% expressed satisfaction with how the association membership fees were used. Although 58% expressed satisfaction, the FGDs across Stratum One and Stratum Two revealed higher dissatisfaction levels as demonstrated in the following remarks:

“Leaders in the forefront have misappropriated the funds. They started very well, but after we contributed money, we do not know what they do with the money. They are the ones fully responsible for our failure to pay contributions for the same” (FGD 2).

“We have been paying money, but we have not seen how the money we pay is being used” (FGD 7).

From the FGDs in Stratum Three, most fishers were not paying the FFTA fees and thus could not comment on the issue. The fishers' perceptions of there being a lack of accountability among the FFTA leaders seem to have discouraged them from paying the fees. The DoF indicated that the FFTA leadership was not able to produce any financial reports when requested to do so.

Transparency

From the FGDs across all the strata, the majority of the fishers were not aware of the existence or the purpose of the FFTA constitution:

“The constitution is there though it is not known by members” (FGD 1).

“We do not even have a fishers association” (FGD 11).

Approximately 80% of the 237 fishers had little or no knowledge of the contents of the constitution of the FFTA. However, the principal researcher was able to obtain a copy of the constitution. This revealed that the association is a non-profit organisation whose main objective is to promote the economic, cultural, social and environmental needs of its members. The constitution prescribes how executive committee members are to be elected and how they should run the affairs of the association in line with the purpose of the association's establishment. Basically, the association was formed with the aim of having leadership that would represent the fishers and fish traders before government and other organisations on various livelihood and fishing business matters.

Most participants in the FGDs felt that the leaders were not abiding by the constitution of the FFTA, especially in their execution of leadership roles and their accountability of funds. Of the 3 strata, only participants of the FGDs in Stratum One indicated that the association leadership did talk about sustainable fishing practices during the meetings that they held. The other participants indicated that they had heard nothing. Interviews with other stakeholders revealed that their access to the association's constitution and information about its operations was limited.

Participation

The information gained from Stratum One FGD indicated that three of the five groups were able to attend meetings and pay membership fees, while the FGDs in Stratum Two and Stratum Three revealed no participation. The survey showed that 41% of the 237 fishers were not attending the FFTA meetings. Of the 59% of fishers who managed to attend the meetings, 80% of these felt that they were not given the opportunity to be involved in decision-making regarding the association's activities. Furthermore, perceptions were mixed among fishers

relating to their use of acceptable fishing practices. This conflict of perceptions was due to the sensitivity of the matter. However, the DoF disclosed that the use of illegal fishing practices among fishers was rampant.

Contrary to the constitutional requirement of yearly elections, elections for FFTA leaders had only been held once, as at the time of data collection, since the inception of the association in 2009. On the positive side, the survey indicated only 23% of the 237 fishers were dissatisfied with the electoral process.

The women in the FGDs that comprised men and women were mostly fish traders, and they revealed that they were completely excluded from all the operations of the association. They attributed this exclusion to them being female and for not being active participants in fishing on the lake. The majority of the other stakeholders indicated not being able to participate in any decision-making process regarding the association's activities.

Effectiveness

The majority of fishers across the FGDs expressed dissatisfaction with the general operations of the FFTA, especially the ability of the organisation to help meet their livelihood needs and to address the fishing challenges that they experience:

“The association needs to be dissolved and form a new one” (FGD 2).

“If the association were effective, the fishers' lives would have improved. We could have done sensible things, but nothing has happened” (FGD 7).

The FGDs also indicated that the fishers resorted to helping one another in solving the different problems that they encountered in their fishing businesses without the aid of the association:

“We are united because if there is an accident while fishing, we work together to help the victims” (FGD 5).

“We do get along with fishers from other places like Itezhi-Tezhi, Lusaka and other fishing camps” (FGD 11).

One of the stakeholders felt that the association had the potential to promote sustainable fishing if adequately organised and empowered:

“The association objectives are very unclear because we would have thought that such an organisation will be in the forefront championing fisheries conservation, but we have had difficulties sharing this objective with them” (Interviewee 3).

Benefit- and burden-sharing

Fishers in the FGDs revealed they did not benefit much from the lake’s resources since they were currently catching less fish than before:

“In my area, I see that the number of fish being caught is reducing because before we used to catch enough. Not only that, we had few people catching fish, but now many have joined the catching of fish. Many of us are involved in the catching of fish” (FGD 1).

The fishers indicated that the FFTA was not helping to address this predicament in their fishing business. The fishers added that the association leadership was not attempting to lighten their livelihood burdens through actions such as linking them to loan providers, NGOs or private firms to enhance their fishing businesses and other sources of income.

“Association leaders agree with our plight, but they may have limitations in addressing them” (FGD 3).

“Association is there though it is not active on issues of solving problems for fishermen” (FGD 6).

5.4.2.2. Central government-controlled governance approach: Department of Fisheries

The DoF is the arm of central government mandated to govern fisheries nationwide. For the Itezhi-Tezhi District, the DoF receives funds from the central government to conduct its roles at the fishery (Table 5.4). All the fishers sampled were aware of the presence of the DoF.

Accountability

The majority of fishers across all the FGDs and other stakeholders were not aware of how the funds were utilised by the DoF. Officials of the DoF stated that the budgeting process for the department's activities had been decentralised to district level, but the final allocation of the budgeted funds was at the discretion of the central government. In addition, minimal funds were usually released from central government. This lack of downward accountability hindered the effective execution of activities such as yearly frame surveys, consistent law enforcement and regular fisheries extension services.

Transparency

The majority of fishers in the FGDs indicated having some access to information regarding the use of recommended fishing methods and gear through their interaction with the extension section of the DoF:

“Yes, we are made aware by DoF that we should adhere to laid down fishing regulations” (FGD 3).

“Yes, we are informed by DoF that we are not supposed to catch small fish but big ones” (FGD 9).

Nevertheless, the DoF indicated it was still limited in information dissemination due to inadequate fisheries extension personnel and funding.

Participation

The FGDs across the strata revealed that fishers were not usually engaged through training programmes or workshops on how to utilise fisheries resources sustainably. As such, they felt that this activity was only meant for the DoF:

“Prevention of fish depletion is for DoF” (FGD 3).

“We only know how to kill fish and not to conserve it” (FGD 8).

The DoF stated that most of the fishers were unwilling to participate in these programmes. Traditional authorities, FFTA leaders and NGOs indicated that they were involved in sensitising fishers to approved fishing methods and gear when the need arose. The DoF further stated that other stakeholders such as the DNPW and the Zambia Police Service were involved in the enforcement of fishing regulations.

Effectiveness

The FGD members felt that the DoF enforced regulations fairly on culprits despite its limited capacity. In addition, the DoF confirmed its lack of capacity to carry out sensitisation and enforcement activities around the lake effectively:

“The only control that is there is licensing. Unfortunately, the lake is quite wide, so to ensure compliance or to monitor compliance has become a challenge such that there are people who fish without a license” (Interviewee 3).

This limited capacity was due to inadequate human resources in relation to the vastness of the lake and the influx of immigrant fishers into the area (Table 5.2). Insufficient funds also hampered the effectiveness of the operations of the DoF. Indeed, 84% of the fishers surveyed indicated a decline in fish catches per fisher in the last 5–10 years, as at the time of data collection, and attributed this decline to the DoF’s lack of capability to prevent it.

Benefit- and burden-sharing

Fishers in the FGDs indicated that there were no benefit-sharing arrangements between fishers and the DoF regarding revenue from fishing fees and levies. All the fishers knew was to buy fishing licences from the DoF and then earn a livelihood through catching and selling fish. The DoF also confirmed that there was no working relationship or governance system between the DoF and the FFTA to enhance benefit and burden-sharing.

In the survey, 99% of fishers expressed the need to participate in a type of governance approach that would promote sustainable fishing of fisheries resources. Through the FGDs, fishers expressed the need for an effective governance structure that would enhance collaboration with other stakeholders because they were not capable of initiating this by themselves:

“Fishers cannot manage to sustainably fish by themselves. We will be catching fish without control, and the fish will finish in the lake” (FGD 7).

“There will be fighting because if I try to stop my fellow fisher from using illegal fishing gear so that we can conserve fish, he will refuse and we may end up fighting” (FGD 10).

The fishers attributed this inability to their low education, the presence of many immigrants, high ethnic diversity and the diversity of opinions among fishers (see Table 5.2).

5.4.2.3. Categorisation or grouping of legitimacy indicators based on stakeholders’ perceptions

Interviews and FGDs indicated that some stakeholders had either not perceived the legitimacy indicators (Table 5.4) (denoted by the term ‘absent’) in each of the two governance approaches or had hardly perceived the indicators (denoted by the term ‘almost absent’) (Table 5.4). In addition, some stakeholders had perceived the legitimacy indicators but not as expected (denoted by the term ‘almost fully present’); for instance, fishers did not receive or access all the information on sustainable fishing methods from the DoF (Table 5.4). As such, the input legitimacy was predominantly ‘almost absent’ in both governance approaches, and this scenario was reflected in their output legitimacy, which was predominantly ‘absent’ (Table 5.4).

Table 5.4: Categorisation or grouping of legitimacy indicators for the two governance approaches for Lake Itzhi-Tezhi fishery

Governance approaches	Legitimacy indicators and categorisation ^b				
	Accountability	Transparency	Participation	Effectiveness	Benefit- and burden-sharing
Fishing community-based	Almost	Almost	Almost	Absent	Absent
	Absent	absent	absent		
<hr/>					
Central government-controlled	Almost	Almost fully	Almost	Almost	Absent
	Absent	present	absent	absent	

b - Authors’ categorisation or grouping of legitimacy indicators based on stakeholders’ perceptions

Source: Authors

5.4.3. Stakeholders' roles under existing governance as regards fishing of the fishery's resources

According to the FGDs (Table 5.5), the leaders of the FFTA were mainly involved in resolving conflicts between the fishers and the government department officials of both the DoF and the DNPW. These conflicts arose during the enforcement of fisheries regulations by government officials to halt lawbreakers who were fishing without park permits. The discussions further revealed that association leaders were also involved in sensitising fishers on acceptable fishing practices (Table 5.5). However, the survey demonstrated that 65% of the 451 fishers expressed dissatisfaction with or were unaware of the sensitisation role of the association leadership.

The FGDs revealed that sensitisation on sustainable fishing practices, enforcement of the fishing rules and regulations, and issuing fishing licences to fishers during the fishing season were the primary roles of the DoF (Table 5.5). The survey confirmed this, with 99% of fishers indicating that the DoF was responsible for the management and conservation of the fishery's resources.

Through interviews, the other stakeholders outlined their roles in the fishery, but these roles were barely noticed or not noticed by the fishers (Table 5.5). A few fishers stated that the DNPW issued entry permits for fishing purposes in the Kafue National Park (not fishing licences, which was the role of the DoF) and helped the DoF in law enforcement against illegal fishing during the closed fishing season. These fishers added that the DNPW had sensitised them on sustainable fishing practices (Table 5.5); the fishers were repeatedly made aware of the need to participate in the use of recommended fishing methods and practices in the fishery. Only 25% of the fishers surveyed confirmed the roles of the DNPW.

Table 0.5: Fishers' perspectives through focus group discussions on the roles of key stakeholders in the promotion of sustainable fishing of resources

Roles of the Fishermen and Fish Traders Association		
	Role	Prominent roles*
	Collection of subscription fees	+
	Conflict management	+++
	Law enforcement support	+
	Improvement of fishers' livelihoods	0
	Provision of transport	+
	Safety support on lake	+
	Sensitisation on sustainable fishing	++
Roles of the Department of Fisheries		
	Fish stock assessment	0
	Fish licensing	++
	Law enforcement	++
	Sensitisation on sustainable fishing	++
Roles of other stakeholders		
Traditional authorities	Conflict management	0
DNPW	Law enforcement support	+
District Municipal Council	Levy collection	0
NGO	Livelihood strategies	0
DNPW	Permit issuance	+
Traditional authorities, DC, DVS	Provision of land/extension services	0
NGO	Safety support on lake	0
DNPW, NGO	Sensitisation on sustainable fishing	+

* Based on the extent to which a role was expressed across the strata and the FGDs

+++ Expressed across all the strata (100%) and in most of the FGDs (>50%)

++ Expressed across all the strata (100%) but in less of the FGDs (<50%) in the stratum AND/OR in 2 strata (>65%) but in most of the FGDs (>50%) in the stratum

+ Expressed in 1 or 2 strata (<65%) and in less of the FGDs (<50%) in the stratum

DC: District Commissioner's Office; DVS: Department of Veterinary Services; NGO: Non-governmental organisation, DNPW: Department of National Parks and Wildlife

Source: Author

5.5. Discussion

5.5.1. Stakeholders engagement in fisheries governance

Most of the stakeholders of Lake Itzhi-Tezhi fishery did not fully participate in the governance of the fishery's resources. Despite the Fisheries Act (22 of 2011) (Government of Zambia, 2011) providing for the local fishing community and other stakeholders' participation, the DoF still carried out most of the operations that promoted sustainable fishing practices and the enforcement of regulations. This situation ultimately limited the DoF in addressing the fishing pressure caused by the ever-increasing population of immigrant fishers into the fishery area. As such, some authors argue that it is imperative to share responsibilities regarding the governance of fisheries' resources between government and other stakeholders, especially the local small-scale fishers (Pomeroy & Berkes, 1997; Carlsson & Berkes, 2005; Nunan et al., 2015). Reasons given for their arguments lie in the government's limited resources, weak governance processes (including accountability), limited capacity and vastness of fishery areas. In the current study, the DoF was equally hampered by such limitations, hence the decline in fish catches per fisher in the lake. In their review on the inland East African and Malawian fisheries, Nunan et al. (2015) also alluded to the need for cordial relationships between the fishers and other stakeholders to enhance the governance of fisheries. In support of this, the Fisheries Act (22 of 2011) (Government of Zambia, 2011) compels the DoF to create an environment of cooperation with local fishing communities and other stakeholders for the promotion of sustainable fishing practices. The same Fisheries Act even provides details for the formation of an FMC. The current study clearly shows that no such engagements had taken place, and instead, the fishery had two ineffective governance approaches.

This study determined that the fishing community-based governance approach through the FFTA was not well organised. The lack of organisation was due to the association being unrecognised by the Fisheries Act (22 of 2011) (Government of Zambia, 2011) despite its registration with the Registrar of Societies. This scenario could be the reason why the government, through the DoF, was not entirely in support of the operations of the FFTA. The lack of support suggests that the government would only acknowledge the presence of an FMC according to the Fisheries Act (22 of 2011) (Government of Zambia, 2011) in a fishery

such as Lake Itzhi-Tezhi fishery. By law, the FMCs, guided by the fisheries' management plan, were the only committees that mandated small-scale fishers to participate in fisheries' governance. However, the government has been very reluctant (see Section 5.3) in implementing the demands of the Fisheries Act (22 of 2011) (Government of Zambia, 2011) concerning the formation of FMCs. This reluctance by government, in turn, compelled fishers to form the association (FFTA) in an attempt to address their specific needs and the needs of the fishery. However, being unrecognised by the Fisheries Act (22 of 2011) (Government of Zambia, 2011), the FFTA could not effectively mobilise fishers to work with government agencies in achieving the fisheries' objectives. This study agrees with Béné (2006) and Deepananda et al. (2016) who argue the need to create well-structured and legally organised committees for fishers. Such committees could be a legitimate way of empowering local populations in fisheries governance.

5.5.2. Significance of legitimacy of a governance process

Legitimacy is crucial to the success of a governance system (Lawrence, 2015). According to Béné and Neiland (2006) and Vatn (2015), accountability, transparency and participation have a broad appeal as indicators of input legitimacy. Downward accountability, defined as “the institutional mechanisms or processes through which executing agents or decision-makers are liable to be called to account by their beneficiaries or consumers” (Béné & Neiland, 2006:33), is fundamental in the governance process. Campbell and Shackleton (2001) and Béné and Neiland (2006) argue that unless the leaders of organisations are firmly downwardly accountable to the rest of the local community, they are often prone to misusing or misappropriating the financial resources entrusted to them. The current study agrees with this observation, noting that the lack of downward accountability was evident in both governance approaches. The fishing community-based governance misused the funds while the central government-controlled governance lacked the funds for activities, probably due to the funds being misused or channelled to other activities at higher government levels.

Downward accountability coupled with transparency plays a significant role in the governance process at district and local community levels since this tends to broaden the participation of local fishers (Davidson et al., 2006). Transparency is usually built on the free flow of information and aids appropriate decision-making in governance (Davidson et al.,

2006). According to the FTTA constitution, the reluctance by the central government in transmitting information to fishers on the formation of a legally recognised committee in the fishery area compelled the fishers to establish the FFTA. The leadership of the association was meant to represent the fishers of the Lake Itzhi-tezhi fishery to government and other organisations on various livelihood and fishing business matters. However, along the way, the stakeholders, fishers in particular, lost confidence or trust in the operations of either the FFTA leadership or the DoF officials. The FFTA constitution was barely known by fishers and was not upheld by FFTA leadership. One unusual aspect was that the association had not held elections since its inception in 2009. Typically, organisations are governed by rules and regulations stipulated in a legally recognised constitution, which shapes members' interactions and their trust and ensures that all elected leaders are accountable to the entire local community (Campbell & Shackleton, 2001; Kateka, 2010; Malasha, 2007). Although the FFTA was unrecognised by the government, if a functional FFTA constitution were in place, it would have aided the governance of the fishing community.

Participation is a useful component in governance that empowers local people by creating a platform for making decisions and raising collective responsibilities (Berdej et al., 2016). However, participation can sometimes be complex (Bochel et al., 2008). At the local community level, this may be due to the socio-economic diversities, local power struggles, weak institutions, unreliable institutional relationships and a conflict of interests among different stakeholders (Quazi et al., 2008). In the current study, lack of strong stakeholder relationships, lack of proper policy direction and slow implementation by the government of the requirements stipulated in the Fisheries Act (22 of 2011) (Government of Zambia, 2011) contributed to limited stakeholder participation in both governance approaches. Lack of active participation of stakeholders in the governance of Zambian fisheries was also reported in studies on the Kafue floodplain fishery region and Lake Tanganyika (Cowx et al., 2011; Haambiya et al., 2016). Haambiya et al. (2016) argue that active participation should be considered throughout the governance process, which should represent all relevant stakeholders and be guided by set legislation, objectives and a clear policy framework.

The low or almost absent input legitimacy (accountability, transparency and participation) in the current study's governance approach ultimately had a negative bearing on output legitimacy (effectiveness and benefit and burden sharing), thus demonstrating the need for a

governance strategy that exhibits both types of legitimacy at Lake Itzhi-Tezhi fishery. This scenario agrees with Bäckstrand (2006), who argues that a lack of effectiveness in regulatory capacity (output legitimacy) prompts the need for improved input legitimacy in terms of transparent and accountable governance processes.

5.5.3. Impact of national legislation and policy on governance and fisheries' resources

Most African countries have revised or developed fisheries legislation and policies to promote the participation of local fishing communities in the fisheries' governance processes (Lewins et al., 2014). However, despite the existence of legislation and policies, reluctance by governments to have them implemented as stipulated has been the norm, resulting in the reported failures in achieving their intended objectives, particularly, promotion of sustainable fishing practices (Béné et al., 2009; Lawrence, 2015; Lewins et al., 2014). The current study at Lake Itzhi-Tezhi fishery demonstrated the same scenario for Zambian fisheries.

The current study determined that the legislation in the Fisheries Act (22 of 2011) (Government of Zambia, 2011) that pertains to the participation of small-scale fishers in governance through the FMC was not observed in the governance process of the Lake Itzhi-Tezhi fishery. Reasons could be that the appointment of the FMC, the development of a management plan for fisheries and the release of funds for such operations are all under the control of the minister responsible for the fisheries sector. Usually, the minister can only act when funds are made available for such activities, which could explain the marked reluctance in implementing the requirements of the same Fisheries Act (22 of 2011) (Government of Zambia, 2011). Madzudzo et al. (2013) argue that the active involvement of government in such matters is usually a recipe for bureaucracy in the decentralisation of authority to the local community.

Furthermore, the NAP adopted by the DoF does not provide adequate guidelines for the specific roles of the small-scale fishing community, the government and other stakeholders in the governance process of fisheries. Ideally, a policy document should specify the expected roles of all stakeholders in the governance process and should form a non-negotiable contract for stakeholders regarding the effective execution of their roles and responsibilities (Allison

& Badjeck, 2004). A standalone national fisheries policy is, therefore, crucial to specify in detail such critical aspects of governance at Lake Itzhi-Tezhi fishery.

Despite the highlighted legislative and policy challenges, fishers in this study were willing to participate in the fishery's governance process. They considered collaboration with other stakeholders, as stipulated in the Fisheries Act (22 of 2011) (Government of Zambia, 2011), as an ideal situation that would encourage them to work towards sustainable fishing in the Lake Itzhi-Tezhi fishery.

5.6. Conclusion

In 2011, the Zambian government made deliberate legislative and institutional changes aimed at reforming its fishing governance system towards co-management. According to our findings for the Lake Itzhi-Tezhi fishery, this was not actualised. Instead, a 'non-functional' dual governance approach - fishing community-based governance approach and central government-controlled governance approach - was identified. This governance approach lacked legitimacy with and enough support from small-scale fishers and other stakeholders in its operations. As such, it has not been efficient in mitigating unsustainable fishing practices.

The study, therefore, suggests a transformation of the current governance approach at Lake Itzhi-Tezhi towards a legitimate co-management governance approach. To accomplish this transformation, the study further suggests active collaboration between fishers and other key stakeholders to enhance the provision of expertise required for the governance process and the promotion of sustainable fishing. The government must prioritise legislation that promotes the participation of local fishers and other stakeholders in the governance of fisheries. Thus, the financial and human resources required to develop such a governance strategy should be made available by the government to initiate the process. Additionally, an appropriate fisheries policy to guide such a governance process is required since none currently exists, not only at Lake Itzhi-Tezhi fishery but also on other fisheries countrywide. Such a governance process would also help to counteract the possible establishment of alternative and unproductive structures of governance, such as the FFTA at local level.

The findings of this study present a scenario that seems to be shared among some other sub-Saharan African small-scale inland fisheries as regards the failure of implementing fisheries governance approaches, such as co-management, to enhance sustainable fishing practices. Despite having legislation that supports local fishers' participation in governance, reluctance by governments to decentralise power and authority to them, through a deliberate policy framework, seems to be one such challenge. Therefore, the suggested recommendations for this case study might also be useful in addressing such governance challenges faced by these African inland fisheries. These recommendations also give support to the agreed instruments by FAO member countries on sustainable fisheries development (Food and Agriculture Organisation, 2015) and towards meeting the UN Sustainable Development Goal 14 on sustainable fishing.

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Chapter 6.

Is a Co-management Approach Feasible on a Small-Scale African Inland Fishery? Assessing the Stakeholders' Perspectives

Abstract

Co-management has been promoted as an alternative approach to the governance of inland fisheries resources and implemented in many African countries. It has, however, not proven to be a silver-bullet solution to improve their governance; hence most African inland fisheries are still experiencing over-exploitation of their resources. As such, there is a need for a co-management governance strategy that should strive to strengthen the participation of stakeholders, primarily the local fishers, as they are fundamental in the governance of fisheries resources. Therefore, this study set out to explore the prospects of initiating a co-management governance approach at Lake Itezhi-Tezhi small-scale fishery. Focus group discussions with fishers and semi-structured interviews with stakeholders were used to collect data. The co-management approach was found to be feasible at Lake Itezhi-Tezhi fishery and a fisheries management committee-based co-management approach has been suggested. The committee creates an appropriate platform for further deliberations by stakeholders in working towards the eventual implementation of co-management. However, the feasibility of the suggested co-management arrangement would be dependent mostly on the stakeholders' ability to address most of the 'key conditions' highlighted in the study. Also, there should be prompt decentralisation of power and authority by the government to local fishers, and establishment of a fisheries policy to provide guidelines for the co-management implementation process.

Keywords: Co-management, fishers, fisheries, governance, 'key conditions', stakeholders

6.1. Introduction

Most Sub-Saharan African countries with small-scale and commercial inland fisheries have been instituting policy and legislative frameworks that promote some decentralisation of

power, authority and responsibilities from the central government to the local community through co-management reforms (Evans, Cherrett, & Pems, 2011; Lawrence, 2015; Nunan, Hara, & Onyango, 2015). These governance reforms were instituted to address the many failed top-down, central government-controlled governance systems that had been in place in several African countries (Béné et al., 2008; Evans et al., 2011; Sen & Nielsen, 1996; Svendrup-Jensen & Nielsen, 1998). As such, the inland fisheries resources have been declining over the past years in most of these African inland water bodies (Ogutu-Ohwayo & Balirwa, 2006). Since the 1990s, fisheries co-management has been viewed as an alternative and appropriate governance strategy in several African countries to address such a predicament (Svendrup-Jensen & Nielsen 1998; Wilson et al. 2010; Lewins et al. 2014).

There is no uniform definition of the term ‘co-management’, but in the context of fisheries, it can be understood as “a partnership arrangement in which the community of local resource users, government, other stakeholders, and external agents share the responsibility and authority for the management of the fishery” (Pomeroy & Rivera-Guieb, 2006:7). Integration of various stakeholders in the co-management design and implementation process is therefore considered to be a significant component of the process (Carlsson & Berkes, 2005). An essential aspect of the reforms leading towards co-management has been the assumption that livelihoods of the local resource users could be improved primarily by improving the status of the fisheries resources through their participation in the governance process (Westlund, Holvoet, & Kébé, 2008).

Despite this understanding and assumption, the co-management reforms have not proven to be the silver bullet for rectifying governance problems in the African inland fisheries sector, but have shown mixed results depending on the different strategies and approaches taken by different countries. Svendrup-Jensen and Nielsen (1998) and Béné et al. (2008, 2009) observed that very few in these failures and successes had to do with the status of the fish stock itself, but were related to various types of governance flaws. For instance, in their review of fisheries co-management in Cameroon, Niger, Nigeria, Malawi and Zambia, Béné et al. (2009) observed that, in the decentralisation process, the power still remained to a greater extent with the central government. That is, transfer of power and responsibilities was mainly carried out to local government instead of local fishing communities, thereby defeating the original purpose of the reforms. Furthermore, studies on institutions and co-

management on Lake Victoria and lakes in Malawi revealed that the relationships between the local fisheries communities, traditional authorities and government fisheries officials were generally not equal in terms of authority and power-sharing, application of the legislation and access to resources (Nunan, Hara, & Onyango, 2015).

It was expected that the introduction of fisheries co-management would have enhanced cooperation among stakeholders and equal relationships with trust being critical to the success of collaboration in the governance process, but that has not been the case in several fisheries (Onyango & Jentoft, 2007; Van Hoof, 2010; Lewins et al., 2014; Finkbeiner & Basurto, 2015; Nunan et al., 2015).

This study, using Lake Itzhi-Tezhi fishery of Zambia as a case, contributes to the ongoing debate on the viability and effectiveness of designing and implementing a co-management approach to enhance sustainable fisheries resources utilisation and in turn the livelihoods of fishers' households in small-scale African inland fisheries. Its objective is to explore the prospects of initiating a co-management approach including multiple stakeholders. In the light of this objective, the following research questions are addressed:

- i. What are the stakeholders' perceptions of the feasibility of a co-management arrangement for Lake Itzhi-Tezhi fishery?
- ii. How would the 'key conditions' for successful co-management be able to address the stakeholders' perceived challenges and benefits during the implementation process?
- iii. What would be the co-management structure and roles of all stakeholders in order to ensure successful implementation of co-management?

6.2. Zambia's fisheries and co-management

Zambia has been working on fisheries co-management during the last decades with mixed results. This goes back to fishing sector reforms in the 1990s in response to its underperformance and decline in fisheries resources. The reforms instituted new governance frameworks in fisheries with the aim of promoting more effective, sustainable and legitimate fisheries governance by changing and sharing responsibilities between the central

government and local actors and institutions. The fisheries co-management reforms were initiated at Lakes Mweru, Bangweulu, Kariba and Tanganyika, but faced several challenges which mostly led to their implementation and sustainability being unsuccessful (Banda, Musuka, & Haambiya, 2015; Béné et al., 2009; Malasha, 2007). Some of these challenges encountered included lack of legislation to support the execution of co-management reforms, poorly equipped extension services to design locally accountable devolved institutions, the prevalence of conflicts of interest among different stakeholders, and reluctance by the central government to relinquish certain responsibilities and pass them on to local resource users (Béné et al., 2009; Banda et al., 2015). As such, with fisheries being common-pool in nature and government-owned by law, the resources in these lakes continued to be over-exploited (Department of Fisheries, 2014a; Haambiya, Kaunda, Likongwe, Kambewa, & Muyangali, 2015; Malasha, 2007).

Given this predicament, the Zambian government decided to review and enact some legislative frameworks and policies to incorporate local community participation and stakeholders' engagement in the governance of the fisheries resources in the inland small-scale fisheries. Some of the legislative frameworks and policies instituted which covered the fisheries sector to achieve this purpose included the Fisheries Act (22 of 2011) (Government of Zambia, 2011), Wildlife Act (14 of 2015) (Government of Zambia, 2015), National Policy on the Environment of 2007, National Decentralisation Policy of 2017, National Development Policy of 2012, and the National Agriculture Policy of 2015. The DoF adopted the National Agriculture Policy of 2015 as an applicable and practical policy guide in its operation. Despite the availability of legislative and policy provisions for the sector, implementation of a functional co-management governance process and structure was still a challenge in the Zambian fisheries sector (Banda et al., 2015; Haambiya et al., 2016). This means the Zambian government still needs to explore further a functional governance approach for the fisheries sector, which operates mainly at a small-scale level.

6.3. Methodology

6.3.1. Theoretical locus of the chapter

The locus of this chapter is within the scholarship of governance of common-pool resources (Ostrom, 2002). A common-pool resource (CPR), such as fisheries, forestry and water, is a system that generates finite quantities of resource units so that one person's use subtracts from the number of resource units available to the others, and it is difficult to exclude anyone from using the resource (Ostrom, Gadner, & Walker, 1994). By this definition, Lake Itezhi-Tezhi fishery has been operating as a CPR mainly under the governance of a centralised government system which has failed to prevent over-exploitation of the fisheries resources. Since the co-management arrangement would involve several stakeholders (Carlsson & Berkes, 2005), any analysis of it falls within the CPR theory (Pomeroy & Berkes 1997). The CPR theory focuses on the ability of people to collaborate in overcoming governance challenges inherent to common-pool resources and avoid the "tragedy of the commons" (Fleischman, Loken, & Villamayor-Tomas, 2014; Ostrom, 2002). To ensure success in the management of the common-pool resource, Ostrom (1990) argued for the importance of collaborative institutions that are preferably organised and governed primarily by resources users.

6.3.2. Framework for analysis of successful common-pool institutions

For this chapter, the criterion of 'key conditions' for successful CPR institutions was employed for analytical purposes. These 'key conditions' were initially developed by Ostrom (1990, 1992) as design principles to help in sustaining CPRs and gaining compliance of the rules over generations. The 'key conditions' were further elaborated by Pomeroy, Katon and Harkes (1998) (Table 6.1) for assessing how successful or not co-management arrangements have been in various inland and coastal fisheries. Different scholars have used these 'key conditions' (Table 6.1) over the years for that purpose (Boeh, Subade, Geganzo, & Subade, 2013; Pomeroy, Katon, & Harkes, 2001; Pomeroy, Mcconney, & Mahon, 2003; Susilowati, 2007). This study conducted a 'pre-assessment of co-management' at the Lake Itezhi-Tezhi fishery using 'key conditions' in order to provide guidance for co-management implementation and hence increase the chances of its success if introduced.

Table 6.1: The ‘key conditions’ criteria for successful fisheries co-management

Serial No.	Criteria	Rationale
i	Clearly defined boundaries	Boundaries of the area to be managed are distinct so that the fishers can have accurate knowledge of them.
ii	Membership is clearly defined	Individual fishers with rights to fish in the bounded fishing area and participate in area management are clearly defined.
iii	Group cohesion	Fisher group, with homogeneity in terms of ethnicity, permanently resides near the area to be managed.
iv	Existing organisations	Fishers have some prior experience with traditional community-based systems and with organisations.
v	Benefits exceed costs	Individual fishers have an expectation that the benefits to be derived from participation in community-based management will exceed the costs of investments in such activities.
vi	Participation by those affected	Most individuals or organisations affected by the management arrangements are included in the governance structure.
vii	Management rules enforced	Monitoring and enforcement are effected and shared by all fishers and other stakeholders.
viii	Legal rights to organise	There is enabling legislation from the government defining and clarifying local responsibility and authority.
ix	Cooperation and leadership at community level	There is an incentive and willingness on the part of local fishers to actively participate in fisheries management.
x	Decentralisation of authority	The government has established formal policy for decentralisation of administrative and management responsibilities and authority to local group organisation levels.
xi	Coordination between government and community	A coordinating body is established, with representation from the fisher group and government, to monitor the fisheries management arrangements.

Source: Pomeroy, Katon & Harkes (1998, 2001)

6.3.3. Understanding stakeholders and their roles

Co-management is one approach of solving CPR management problems through partnerships among different stakeholders (Carlsson & Berkes, 2005; Haambiya et al., 2016). In the context of natural resource management, Pomeroy & Rivera-Guieb (2006) defined stakeholders as “individuals, groups or organisations who are, in one way or another,

interested, involved or affected (positively or negatively) by a particular project or action toward resource use”. Stakeholders may originate from geographical proximity, historical association, dependence for livelihood, institutional mandate, economic interest or a variety of other concerns (Pomeroy & Rivera-Guieb, 2006). In the co-management of fisheries resources, they may include fishers and their households, government agencies, boat owners, fish traders, community-based groups, local business owners, local traditional authorities, representatives of non-governmental organisations (NGOs), private firms and others (Pomeroy & Rivera-Guieb, 2006). However, not all stakeholders have the same level of interest in the co-management of fisheries resources. Therefore, there are primary stakeholders who assume a more active role in the governance and management of the resources, and secondary stakeholders who simply play consultative roles and provide other needed resources in the process (Borrini-Feyerabend & Buchan, 1997).

For this study the primary stakeholders included fishers, government agencies such as the Department of Fisheries and the Department of National Parks and Wildlife, traditional authorities, the Fishermen and Fish Traders Association (FFTA) and a non-governmental organisation (NGO). Secondary stakeholders included government agencies, such as the Department of Agriculture and the Department of Livestock, the Itezhi-Tezhi district council (local government), the District Commissioner’s office, and two private firms.

6.3.4. Study site

The human-made Lake Itezhi-Tezhi lies on the Kafue River in the Central province of Zambia at 15° 46’S and 26° 02’E (Figure 6.1) and was built in 1977 (Swedish Consultants, 1971; Godet & Pfister, 2007). A large portion of the lake is in the Kafue National Park (Figure 6.1) and under the jurisdiction of the DNPW as stipulated under the Wildlife Act (14 of 2015) (Government of Zambia, 2015).

One of the roles of the DNPW was to ensure that no person accessed the fisheries resources in the lake without a park entry permit; this was intended to prevent indiscriminate harvesting of the resource (Figure 6.1). The DoF was also mandated to manage and conserve its fisheries resources of Lake Itezhi-Tezhi under the Fisheries Act (22 of 2011 (Government of Zambia, 2011) (Figure 6.1). The mandate was mainly carried out through enforcement of the closed

fishing season every year between December and February and prohibition of the use of illegal fishing gear and methods during the fishing season (Cowx, Lungu & Mills, 2011; Kefi & Mofya-Mukuka, 2015). Therefore, the two government departments were expected to collaborate in the conservation and management of the fisheries resources, especially during the closed fishing season.

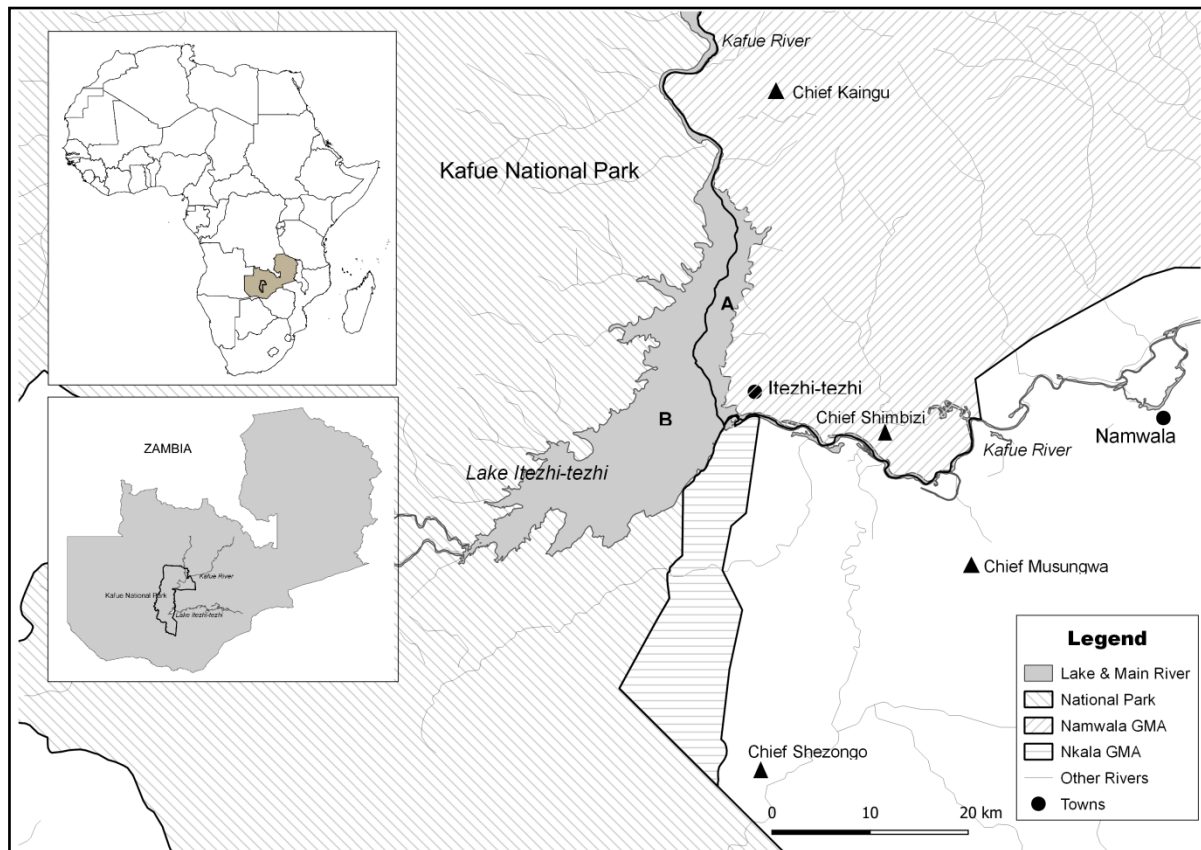


Figure 6.1: Map showing Lake Itezhi-Tezhi, Kafue National Park and chiefdoms

Source: Author

The fishing villages along the lake were under the traditional governance of four prominent chiefs, namely Kaingu, Musungwa, Shimbizi and Shezongo (Figure 6.1). Several headmen¹⁰ assisted these chiefs in the running of the daily affairs in these villages. Therefore, under customary laws, all the fishers were accountable to the chiefs and headmen in these villages where they resided as they conducted their fishing activities in the lake to earn a living. The fishing community was comprised of immigrant and resident fishers who conducted their

¹⁰ A man who in a leader of a village in a chiefdom

fishing and fishing-related activities based on access rights they had to the fishing sites on the lake during the fishing season (March to November). Access to fishing sites and withdrawing of fish from those sites was only possible through the park entry permits and fishing licences issued by DNPW and DoF respectively. No person was permitted to catch fish during the closed fishing season (Department of Fisheries, 2014b). The fishing community had a Fishermen and Fish Traders Association (FFTA), registered with the Zambian Registrar of Societies. The intention of the association was for every fisher and fish trader to be a registered member in order to attend to their wellbeing effectively.

6.3.5. Data collection and analysis

Qualitative data were collected in the study area between March and July 2016. Because of the complexity of the small-scale fisheries and heterogeneity of stakeholders in a co-management type of governance, a transdisciplinary (TD) approach was used (Lang et al., 2012). The approach aids participation of stakeholders in co-designing and co-production of knowledge that would enhance sustainable governance of fisheries resources (Yeboah-Assiamah, 2018). However, due to the limitation of time in this PhD project, a consulting transdisciplinary approach was adopted (Mobjork, 2010). In this approach, stakeholders simply respond to the study being carried out and researchers bear their viewpoint in mind during the study; the stakeholders are not actively included in the actual production of knowledge and designing process (Mobjork, 2010). As such, focus group discussions (FGDs) with fishers and semi-structured interviews with other stakeholders of the fishery were used to implement this approach (Kittinger, 2013).

Furthermore, since the characteristics of fishers and the set up of the fishery are heterogeneous in relation to distance and accessibility to the fishing sites from homesteads, a proportionate quota sampling methods was used (Alvi, 2016). This type of sampling helped to determine relatively homogenous sample sizes of fishers from 3 strata of the fishery that comprised fishing villages and fishing camps (see more details for sampling and stratification in Chapter Three, section 3.5).

Twelve FGDs, about 10 participants in each FGD, and 17 interviewees were purposefully selected for the study as described in Chapter Three of this study. The overarching themes for

interviews and FGDs were stakeholders' perceptions on the feasibility of co-management arrangements, the expected challenges and benefits, the expected roles of various stakeholders, and the possible governance structure in the co-management arrangement.

Qualitative data collected were analysed through the development of themes and sub-themes from the transcribed scripts, coding the participants' responses and linking them to the different themes created, and then analysing the content qualitatively and quantitatively (Krippendorff, 2004). Reliability and validity were addressed by using different sources of data (Kohn, 1997) and the quota sampling technique.

6.4. Results

6.4.1. Stakeholders' perception of the feasibility of a co-management arrangement

Fishers' perceptions through all the FGDs were that co-management was a welcome approach for sustainable fishing of the fishery's resources and livelihood improvement. They expressed the view that neither the government nor the fishers were able to govern the fishery on their own because of the limited resources and capabilities. They indicated that they were in a strategic position to participate as they were knowledgeable about each other and the fishery. These were some of their similar comments to that effect:

"If the association [FFTA] is strong, there are many benefits. The association can work closely with DoF and DPNW, who can help source funds for the conservation of the fish before the fish finishes in the lake" - FGD 2

"The fishermen need help from the association [FFTA], committees, DoF, DNPW and traditional leaders in order to conserve fish. If the fishermen get all the help from these groups of people, they can manage to conserve fish" - FGD 9

In agreement, DoF officials stated that it had been a great challenge, because of their limited resources, to enhance sustainable fishing of fisheries resources, hence the over-exploitation of the fishery's resources over the years. A need for collaboration with other stakeholders was expressed to prevent further resource over-exploitation. Their focus was to have the full

participation of the fishers, being the primary resource users. These are examples of their views:

“To an extent, that can help if fishers are involved in the governance of the fisheries resources” - Interviewee 2.

“The fishermen will appreciate DoF and DNPW when they are brought together. On the other hand, when DNPW is brought to work with the fishermen, they will appreciate DNPW, and it can be beneficial to them” - Interviewee 1

The other stakeholders (local government, the NGOs, private firms, and some government ministries and departments) also expressed the need to be part of the process as fish from the lake was the primary source of income, employment, food and nutrition for the fishing community and the other inhabitants of the Itezhi-Tezhi district. The statement below was one of many similar views expressed by the other stakeholders:

“Fishing community participation in the governance system alongside other stakeholders would be ideal for the fishery” - Interviewee 4

6.4.2. ‘Key conditions’ for success of co-management arrangements

6.4.2.1. ‘Key conditions’ that address expected challenges for successful co-management

Through the FGDs and interviews, fishers and other key stakeholders (DoF, DNPW, FFTA, NGOs and traditional authorities) highlighted some expected challenges that needed to be addressed during the development and implementation of co-management (Tables 6.2). Some challenges identified by the fishers and the key stakeholders were the need for capacity building among fishers, conflicts or lack of cooperation among fishers, and lack of cooperation between fishers and other stakeholders during the implementation process. They also identified the need for financial input for the co-management implementation to be a likely challenge to address. Also, the other key stakeholders perceived the lack of visible benefits accruing to fishers during the co-management undertaking to be a source of discouragement for their full participation.

Table 6.2: Expected challenges in co-management: fishers' and other key stakeholders' perspectives

Expected challenges	Fishers' priority^a	Other primary stakeholders' priority^b
Need for a voice for fishers	+++	+++
Need for awareness to participate in law enforcement	+++	+
Need for capacity building among fishers	+++	+++
Need for visible benefits to fishers	0	+++
Conflicts and lack of cooperation among fishers (if co-management arrangement not correctly understood)	+++	+++
Conflicts and lack of cooperation between fishers and other stakeholders	+++	+++
Conflicts among stakeholders (not with fishers)	0	+
Presence of elite capture	0	+
Need for financial input for co-management implementation	++	+
Mistrust among stakeholders	+	+
Increased immigrants among fishers	0	+

Note:^a: Based on the extent to which a role was expressed in the strata and the FGDs

+++ - Expressed in all the strata (100%) and among most FGDs (>50%)

++ - Expressed in all the strata (100%) but in fewer FGDs (<50%) in the strata OR in 2 strata (>65%) but among most FGDs (>50%) in all the strata.

+ - Expressed in 1 or 2 strata (<65%) and in less of the FGDs (<50%) in a stratum

0 - No comment

^b: Based on comments from key stakeholders directly attached to the fishery (DoF, DNPW, Traditional authorities, NGO & FFTA)

+++ - Comments from at least 4 stakeholders

++ - Comments from 3 stakeholders

+ - Comments from 1 or 2 stakeholders

0 - No comment

Source: Author

The co-management challenges identified by the primary stakeholders would be addressed by fulfilling certain 'key conditions', thus enhancing the success of the co-management arrangement (Table 6.3). For instance, (i) the lack of cooperation among fishers and fishery's stakeholders would be addressed by fulfilling the 'key condition' in defining clear fishing boundaries on the lake between fishers and the government departments (DNPW and DoF); (ii) the lack of an effective voice for the fishers' needs would be addressed by fulfilling the 'key condition' of having a clearly defined membership registration and monitoring system

for fishers. Similarly, ‘key conditions’ (iii), (v), (viii), (x) and (ix) would help to address the other expected co-management challenges (Table 6.3).

Table 6.3: ‘Key conditions’ to help address all the primary stakeholders’ expected challenges

Serial No.	‘Key conditions’	Expected challenges of fishers	Expected challenges of other primary stakeholders ^C
i	Clearly defined lake boundaries	Conflicts and lack of cooperation between fishers and other stakeholders because of undefined lake boundaries.	
ii	Membership clearly defined	Need for an effective FFTA to be a voice for all registered fishers.	Need for a reliable FFTA to be a voice for all registered fishers; need for proper registration and monitoring of fishers.
iii	Group (fishers’) cohesion	Conflicts and lack of cooperation amongst fishers themselves if co-management arrangement is not understood correctly.	Conflict and lack of cooperation amongst fishers themselves if co-management arrangement is not understood correctly.
v	Benefits exceed costs	Need for financial input to operationalise co-management may lead to high transaction costs.	Likely failure to realise benefits accruing to the fishers because of high transaction costs.
viii	Legal rights to organise co-management	Need for awareness for fishers to participate in law enforcement through co-management.	Need for awareness for fishers to participate in law enforcement through co-management.
x	Decentralisation of authority	Lack of capacity to govern the fishery by themselves; need for stakeholders’ assistance.	Lack of capacity to govern the fishery by themselves; need for stakeholders’ assistance.
ix	Cooperation and leadership at the community level	Lack of cooperation amongst fishers themselves if co-management arrangement is not understood correctly.	Lack of cooperation amongst fishers themselves if co-management arrangement is not understood correctly.
		Need for building capacity among the majority of fishers resulting from their low educational levels.	Need for capacity building among fishers in leadership skills and other aspects.

Note: Serial numbers in this table are aligned with those in Table 6.1 for consistency’s sake.

Source: Author (Adapted from Pomeroy, Katon, & Harkes (1998))

6.4.2.2. *'Key conditions' that highlight benefits for success and sustainability of co-management*

Through FGDs and interviews, all the primary stakeholders envisaged some benefits that would filter down to fishers' households, the other fishery stakeholders and the fishery at large (Table 6.4). Some benefits identified by all the primary stakeholders were that co-management could provide a voice for fishers through the FFTA and increased stakeholder support of fisheries governance. Also, the fishers and a few key stakeholders identified effectiveness in law enforcement, increased fish stock and increased fish catches as other critical benefits.

Table 6.4: Benefits for the sustainability of the governance approach: all the primary stakeholders' perspectives

Benefits	Fishers' priority ^a	Other primary stakeholders' priority ^b
A voice for fishers through the FFTA	+++	+++
Effective law enforcement	+++	+
Increased fish stocks	+++	+
Increased stakeholder support	++	+++
Increased income through other sources	++	0
Improved fishers' livelihood	0	++
More income sources for FFTA	++	0
Increased fish catches	++	+
Increased income through fishing	+	0
Benefit to future generation	0	+

Note: ^a & ^b: Refer to Table 6.2

Source: Author

The expected benefits would be realised by fulfilling the appropriate 'key conditions' for enhancing the success of the co-management (Table 6.5). For instance, (iv) the FFTA had been in existence at the fishery representing the fishers since 2009 and was therefore related to a 'key condition' of an existing organisation (association) at the fishery; an indication of

fishers' ability to mobilise themselves for co-management; (v) increased fish catches, increased fishing income, increased alternative sources of income, and improved livelihoods were related to a 'key condition' of ensuring these benefits exceeded investment and transaction costs during implementing co-management. Similarly, 'key conditions' (vii), (ix) and (xi) would help to realise the other expected benefits (Table 6.5).

Table 6.5: 'Key conditions' for co-management that would help realise all the primary stakeholders' expected benefits

Serial No.	Key conditions	Fishers' perspectives	Other primary stakeholders' perspectives
iv	Existing organisations	FFTA - has been representing all fishers and can still play that role if well organised.	FFTA - has been representing all fishers and can still play that role if well organised.
v	Benefits exceed costs	Promote increased fish catches by fishers.	Promote increased fishers' household income from several sources due to stakeholders' input.
		Promote increased income sources as other stakeholders would ensure fishers were assisted.	Improve the livelihoods of fishers' households expected.
vii	Management rules enforced	Collective enforcement of fisheries laws and regulations by fishers and other responsible stakeholders (DoF and DNPW).	
ix	Cooperation and leadership at the community level	Cooperate between fishers and other stakeholders to address governance challenges currently being faced (i.e., fishery governed primarily by government).	
xi	Coordination between government and community	Proposed organisational structure to increase stakeholders' support with their expertise.	

Note: Serial numbers in this table are aligned with those in Table 6.1 for consistency's sake.

Source: Authors (Adapted from Pomeroy, Katon, & Harkes (1998))

6.4.3. Structure and roles of stakeholders in the co-management governance approach

6.4.3.1. *Stakeholders' perceptions of the expected structure for co-management*

As regards the governance structure, more than three quarters of the FGDs in each of the strata, the other primary stakeholders and a key informant indicated that the Fishermen and Fish Traders Association (FFTA) needed to play a significant role in the governance structure at a local level. This is because the FFTA was a principal representative of fishers in any collaborative forum with other stakeholders. In order to strengthen the FFTA, the majority of the primary stakeholders proposed the formation of committees with elected leaders among fishers in fishing camps and fishing villages. The committees would enable them to receive input from grassroots members into the functions of the FFTA and to offer checks and balances for accountability purposes. These were some of the underlying perceptions:

“Yes, we have agreed that the association [FFTA] should continue, but there is a need for the formation of committees” - FGD 11

“Formation of various committees on fishing camps and a mother committee or board recognised and supported by legislation can be beneficial to fisheries conservation” - Interviewee 4

“If the fishermen arrange themselves into committees which should form an association, then they can select the chairman for each committee and the association [FFTA]. Then, they should group villages into groups of 6, and 1 leader should be selected to look into all the six groups from the six fishing villages” - Informant 2

“The association [FFTA] should be close to fishermen and hear their challenges. They should then take these challenges to the Department of Fisheries” - FGD 10

Furthermore, the primary stakeholders and a key informant added that these committees would have the responsibility of accounting for their members and their eligibility to conduct fishing activities in the fishery; this would help monitor the migration of fishers into the fishing community and fishing sites. The committees would also be effective channels to monitor the use of unsustainable fishing practices by the fishers themselves. Livelihood needs

of the fishers would easily be identified through the committees and channelled to the FFTA leadership for further collective action with other stakeholders. These were some of the majority views:

“In each village, the chairman will be responsible for ensuring that he knows the number of fishermen who are members of the association in their place. These will be the ones having that authority to catch fish in the lake. Whoever is not a member would have no authority to get a fishing license or park entry permit.” - Informant 2

“The other thing is that within each zonal [village] committee, we could have scouts ... to check on who is using illegal methods of fishing ... [and] bring them to the zonal committees” - Interviewee 1

“We need to form committees through which we can access any help we need ... to enable us to conserve fish” - FGD 3

6.4.3.2. Stakeholders’ perceptions of the expected roles in co-management

Through FGDs and interviews, all the primary stakeholders were able to prioritise the roles that fishers and the FFTA would be expected to play in the co-management governance approach (Table 6.6). Fishers would cooperate with stakeholders in the designing and implementation of co-management. They would also fully participate in the whole process to have a sense of responsibility and ownership of co-management. In addition, the fishers stated they would ensure they abide by fisheries laws and regulations and contribute to their being enforced.

All the primary stakeholders stated the FFTA leadership would be expected, firstly, to be a voice for fishers to the fishery’s stakeholders on various issues that affect them; secondly, to uphold their constitution in order to ensure the trust and confidence of members; and thirdly, to source funding for the operations of the association and meeting members’ needs. Also, the fishers indicated the FFTA would be useful in mobilising all fishers to be its members and to ensure that they support the co-management process. The other stakeholders added that the FFTA would be expected to collaborate more with other stakeholders for the success of co-management.

Table 6.6: Expected roles of fishers and Fishermen and Fish Traders Association in co-management: primary stakeholders' perspectives

Roles	Fishers priority^a	Other primary stakeholders priority^b
Fishers		
Cooperation with all stakeholders	+++	+++
Full participation in the entire process	++	+++
Contribution to law enforcement	++	0
Adherence to law	+	+
Fishermen and Fish Traders Association		
Cooperation with all the stakeholders	0	+++
Mobilisation of fishers	+++	0
Voice for fishers	+++	+++
Upholding of constitution	++	+
Fund sourcing for projects	+	++
Contribution to law enforcement	+	0
Coordination of activities and programmes among fishers	+	0
Sensitisation	0	+
Upholding of constitution	0	+

Note: ^a & ^b: Refer to Table 6.2

Source: Author

Through FGDs and interviews, all the primary stakeholders prioritised the roles the remaining primary stakeholders would be expected to play in the proposed co-management approach (Tables 6.7). All the primary stakeholders indicated that the DoF would help to build capacity in fishers through training programmes to promote sustainable fisheries resource utilisation. In addition, the fishers indicated that DoF would continue to implement the closed fishing season programme to enhance fish stocks and to promote collaboration with all stakeholders in fisheries law enforcement. The other primary stakeholders indicated that the DoF would also play the role of a mediator among all the stakeholders of the fishery.

All the primary stakeholders stated that the DNPW would cooperate with fishers who carry out their fishing operations in the national park, and would continue to issue park permits to fishers as a monitoring tool to preventing illegal fishers. The other key stakeholders indicated that the DNPW would also participate in fisheries law enforcement.

All the primary stakeholders indicated that the NGOs would offer financial and logistical support towards sustainable fisheries resource utilisation and fishers' livelihood. They also stated that the traditional authorities would mobilise their subjects, the fishers, to participate fully in the co-management arrangement. They would also cooperate with all the other stakeholders in co-management implementation. In addition, the traditional authorities would participate in fisheries law enforcement.

Regarding the roles of secondary stakeholders, the Department of Livestock and the Ministry of Agriculture indicated they would offer technical support and capacity-building programmes towards enhancing fishers' livelihoods. They would also facilitate alternative sources of income for fishers, such as cage fish farming on the lake, and agricultural and livestock production. The local government indicated that it would also create an environment conducive for fish trading and other entrepreneurial ventures by fishers. They would also provide social amenities towards improving fishers' livelihoods. The private and parastatal organisations stated that they would offer financial and logistical support and capacity-building programmes to fishers.

Table 6.7: Expected roles of other primary stakeholders in co-management: stakeholders' perspectives

Roles	Fishers' priority^a	Other primary stakeholders' priority^b
Department of Fisheries		
Closes fishing season implementation	+++	0
Mediator among all stakeholders	0	++
Capacity-building (training) programmes for fishers	+++	++
Law enforcement around the fishery	++	0
Provision of financial support	+	+
Technical support	+	+++
Issuance of fishing licences	+	+
Sensitisation of fishers on fish conservation	0	+
Coordination of conservation programmes among stakeholders	+	0

Department of National Parks and Wildlife

Cooperate with fishers	+++	+++
Park entry permit issuance	++	+++
Contribution to law enforcement	0	++
Sensitisation of fishers to fish conservation	0	+

Non-Governmental Organisations

Financial and logistical support	+	++
Sensitisation of fishers on fish conservation	+	0
Monitoring of co-management implementation	0	+
Capacity building (raining)	0	+

Traditional Authorities

Mobilisation of fishers	++	+++
Collaborate with other stakeholders	+	+++
Contribution to law enforcement	+	+++
Sensitisation of fishers on fish conservation	+	0

Note: ^a & ^b: Refer to Table 6.1

Source: Author

6.5. Discussion

6.5.1. 'Key conditions' for successful co-management

Studies on existing co-management arrangements in Asia, the South Pacific and Africa have shown that small-scale fishers can manage fisheries resources sustainably by fulfilling certain 'key conditions' (Pomeroy & Williams 1994; Pomeroy, Katon, & Harkes 2001). This study conducted a 'pre-assessment of co-management' based on stakeholders' perceptions aligned to the 'key conditions' in order to ascertain the feasibility of undertaking what they would regard as successful co-management at the Lake Itezhi-Tezhi fishery. The study indicates the need to fulfil all the eleven 'key conditions' during the planning and implementation process in order to address the challenges and realise the benefits highlighted by the stakeholders.

(i) *Clearly defined boundaries:* Having clearly defined physical boundaries around a fishery is essential in preventing conflicts between fishers and government authorities. Although a large part of Lake Itezhi-Tezhi was well defined in terms of physical boundaries, the

boundary between the lake portion inside the Kafue National Park and the portion outside the park was still unclear and was a source of conflict. To avoid further conflict which may jeopardise co-management goals, the DNPW would need to set up physical beacons along the contentious boundary.

(ii) Membership clearly defined: Membership of fishers on the fishery was not clearly defined because of the open-access nature of the fishery and the inefficiency of the FFTA in organising the fishers. Therefore, one option for defining membership would be to strengthen the fishing licensing process for fishers by the Department of Fisheries to act as an inventory and monitoring tool for active fishers. Fishers would be required to cooperate and collaborate with the DoF to make this operational. As was the case with the Beach Management Unit (BMU) on Lake Victoria (Nunan, 2010), the fisheries management committee (FMC) earmarked for establishment would also be required to have a well-monitored fishers' register for taking stock of fishers' population at any given time.

(iii) and ix) Group (fishers) cohesion, cooperation and leadership at the community level: Cooperation among all stakeholders, motivated by incentives, is crucial for the success of a co-management arrangement (Pomeroy & Rivera-Guieb, 2006). Lack of cooperation among stakeholders was one of the reasons for the failure of the current governance system at Lake Itzhi-Tezhi fishery. Incentives to prevent the declining individual fish catches, low household income levels, high dependence on fishing, and increasing numbers of immigrant fishers would be expected to promote cooperation from the fishers. Besides, incentives to reduce the threat of over-exploitation of the fishery's resources, increased compliance with regulations, and increased resources for enforcement and monitoring would enhance cooperation from the government.

In order to improve leadership, the FMC would be expected to organise capacity-building programmes for fishers so that the fishing village committees (FVC) and the fishing camp committees (FCC) can be run effectively. The capacity-building programmes would have to cover topics such as responsibility, accountability and effectiveness. Such programmes were also being recommended for the BMU for Lake Victoria, Kenya, after the experience of elite capture at the expense of the less educated local fishers (Etiegnia, Kooy, & Irvine, 2019).

(iv) *Existing organisations (associations)*: The Fishermen and Fish Traders Association (FFTA) has been in existence since 2009. Because of its weak governance arrangement, it has not been effective in representing the fishers to other stakeholders on socio-economic matters. As such, the FMC would be expected to effectively represent the fishers on such matters. The proposed inclusion of FVC and FCC in the co-management structure would enhance effective representation and participation of fishers from the grassroots level (see section 6.5.2 for details).

(v) *Benefits exceeding cost*: The co-management system would be expected to provide benefits, especially at the fishers' household level (Pomeroy & Rivera-Guieb 2006). Fishers would expect increased fish catches, increased incomes and improved livelihoods for their input into the co-management operations. This expectation is in line with Pomeroy and Rivera-Guieb's (2006) argument that benefits from a co-management arrangement usually promote collective responsibility among fisheries resource users. That would also be an ideal situation in the governance of the Lake Itzhi-Tezhi fishery. Furthermore, the Fisheries Act (22 of 2011) (Government of Zambia, 2011) provides for the establishment of the Fisheries Development Fund for the FMC operations, and this would also enhance benefit realisation for fishers. However, government funding for co-management operations might not be reliable; additional sources, such as a portion of fishing licence fees, may be required for effective implementation (Lawrence, 2015).

(vi) *Participation by those affected*: The results of the current study show that all the stakeholders were negatively affected by the current state of governance and fisheries resources, and were accordingly willing to participate in the co-management arrangement. Enactment of the Fisheries Act (22 of 2011) (Government of Zambia, 2011) was meant to incorporate fishers and other stakeholders in decision-making processes of co-management. The incorporation of stakeholders is in line with the arguments proffered by Charles (2011) and d'Armengol et al. (2018) that engagement of a diversity of stakeholders in a co-management initiative of small-scale fisheries usually enhances the governance and management of fisheries resources.

(vii) *Management rules enforced*: To reduce unsustainable fishing practices, enforcement of or adherence to laws and regulation would be critical in co-management. According to Van

Hoof (2010), the success of co-management mainly depends on co-operation and collective action among participating stakeholders, particularly the fishers, in law enforcement. The proposed formation of FVC and FCC in co-management structure would encourage fishers at the grassroots level to get involved, since they know the lawbreakers and how to best deal with them. Furthermore, with the current limitation of human resources by the government to enforce the law, it would even be necessary to legally empower some fishers with the authority to apprehend and prosecute offenders. Such legal empowerment of fishers may require providing them with financial incentives.

viii) Legal rights to organise co-management: As far as the Lake Itzhi-Tezhi fishery is concerned, the Fisheries Act (22 of 2011) (Government of Zambia, 2011) provides a platform for stakeholders' participation in the governance process of fishery through the FMC. The presence of legislation is in line with d'Armengol et al. (2018), who argue that a supporting legal and institutional framework is essential in facilitating the emergence of co-management. The same Fisheries Act of 2011 mandates the FMC to incorporate six fishers and at least seven other stakeholders of the fishery into its operations. However, most fishers were not aware of their legal right to participate in the prudent management of fishery's resources. As such, the fisheries policy would be required to elaborate on specific guidelines and responsibilities for fishers and the other stakeholders of the fishery in co-management, including those responsibilities suggested in this study.

(x) Decentralisation of authority: Allison and Badjeck (2004) argued that if empowering stakeholders in a co-management arrangement is the goal, then the process should be connected to the decentralisation of power and authority to the local community. However, the Fisheries Act (22 of 2011) (Government of Zambia, 2011) does not elaborate on how the government intends to decentralise its power and authority and transfer it to local fishers and other stakeholders. According to Pomeroy and Berkes (1997), this lack of elaboration could be because decentralisation of power was considered an evolving process that was adjusted and matured over time. Therefore, there was no better form of decentralisation, either delegation or devolution to support a particular co-management (Pomeroy & Berkes, 1997). Also, the government needs to develop more knowledge, experience and political will in order to implement an appropriate form of decentralisation. This scenario is what usually breeds bureaucracy in the co-management implementation by the governments. However,

based on the recommendation of Pomeroy and Berkes (1997), the government of Zambia would have to give direction on the power-sharing and decision-making arrangements to participating stakeholders through the fisheries policy, which was not yet in place at the time of the study.

(xi) Coordination between government and community: The establishment of the FMC, as demanded by the Fisheries Act (22 of 2011) (Government of Zambia, 2011), would play a pivotal role in coordinating the governance and management of the fishery, resolving conflicts, mobilising the enforcement of fisheries laws and regulations, and enhancing fishers' livelihoods. Its establishment would be done through engaging and mobilising all the stakeholders of the Lake Itzhi-Tezhi fishery (see section 6.5.2 for suggested details on its establishment at the Lake Itzhi-Tezhi fishery).

6.5.2. Structure for co-management and roles of stakeholders

The results show that co-management could be appropriate for the governance of Lake Itzhi-Tezhi fishery if adequately guided by the provisions of the legislation and the engagement of stakeholders. This finding is in line with the arguments put forward by Pomeroy and Williams (1994) and Prieto, Ruiz-mallén and Corbera (2018) that the different structural components in a co-management arrangement should be entrenched through the necessary legislation to make operational and collective decisions in the fishery. The current study also agrees with the argument by Carlsson and Berkes (2005) that, in order to foster the success of co-management, it should be defined in formalised arrangements where multiple stakeholders share governance functions and responsibilities on a given fishery. Wilson et al. (2010) added that empowering only government agencies has resulted in a significant barrier to integrating decision-making from other stakeholders in fisheries governance and management

The different stakeholders in this study advocated for multiple arrangements for governing the fishery. Based on their perceptions and the requirements of the Fisheries Act, a structure for the operationalisation of the FMC-based co-management arrangement for Lake Itzhi-Tezhi fishery has been proposed (Figure 6.2). This proposal is based on the argument by some scholars (Pomeroy & Williams 1994; Kateka 2010; Obiero et al. 2015) that responsibilities, power and authority that the government, local fishers and other stakeholders

possess in a co-management arrangement usually depend on country- and fishery-specific conditions.

Firstly, the existing Fishermen and Fish Traders Association (FFTA) at Lake Itzhi-Tezhi fishery would have to be overhauled or disbanded and replaced by a legally recognised FMC that provides for stakeholders' participation. Its position in the fishery would be similar to that of the BMU on Lake Victoria and Beach Village Committee on the Malawian lakes, but with different leadership and membership structures (Davis, 2003; Etiegnia et al., 2019). According to the Fisheries Act (22 of 2011) (Government of Zambia, 2011), the FMC would be the basis for formulating the fisheries management plan and coordinating centre for the Lake Itzhi-Tezhi fishery. It would focus on developing an integrated approach to the governance, management and sustainable utilisation of fisheries resources in a fishery.

Furthermore, the government minister responsible for the fisheries sector would appoint this committee. This is in tandem with the argument of several authors that the central government's role is cardinal in establishing conditions for co-management, that is, the creation of legitimacy, accountability and partnership for the local organisation and institutional arrangements (D'Armengol et al., 2018; Lundström & Nordlund, 2016; Nielsen et al., 2004; Njaya, Donda, & Béné, 2012). However, this arrangement works well with the commitment and support of the central government (Béné et al., 2009; Lawrence, 2015; Lewins et al., 2014). This support would be expected from the government for the Lake Itzhi-Tezhi fishery co-management because of the benefits attached to its success.

The FMC would be comprised of a representative from each of the identified fisheries' stakeholders to perform different roles (see the detailed stakeholders' roles in the results section 3.2) for the success of the proposed FMC-based co-management arrangement for the Lake Itzhi-Tezhi fishery (Figure 6.2). The FMC would be comprised of, among other stakeholders, 6 fishers from the FVC and FCC arrangement, and 1 from each of the chiefdoms (traditional authorities) around the fishery as stipulated in the Fisheries Act (22 of 2011) (Government of Zambia, 2011). The DoF's representative would play the secretarial

that effect, the 6 fishers in the FMC would be elected representatives from each FVC and FCC of the fishing villages and fishing camps respectively. The election of representatives agrees with Davis's (2003) argument that it promotes a sense of responsibility and participation among its members, and reduces tendencies towards corruption. On the contrary, Nunan et al. (2015) argue that this is only possible if power and kinship relations do not influence the electoral process, as observed in the BMU of Lake Victoria and Beach Village Committees of Malawi. For the Lake Itzhi-Tezhi fishery, these committees would be a means for active local fishers' participation and channels for law enforcement and monitoring of fisheries activities.

There is a further need for an appropriate policy to guide such a co-management arrangement. The current National Agriculture Policy (2015-2030) adopted by DoF does not provide adequate guidelines. This study argues that the lack of a properly defined policy framework on co-management could be a further reason why the government, through DoF, has been struggling to make progress on the issue of co-management implementation as demanded by Fisheries Act (22 of 2011) (Government of Zambia, 2011). To date, there has been no proper co-management arrangement on any Zambian fishery operating on the basis of the requirements of the Fisheries Act, though there have been collaborative management arrangements between government and fishing communities on some fisheries (Department of Fisheries, 2017, 2018).

6.6. Conclusion

This chapter has shown that the co-management arrangement for the Lake Itzhi-Tezhi fishery was feasible, but it would depend on establishing the fisheries management committee structure, actualising the suggested roles of the stakeholders, and adhering strictly to the legislation on local community participation. The co-management implementation and success would also be dependent on the stakeholders' ability to meet most of the highlighted 'key conditions' that would help to address the challenges and realise the benefits identified in this chapter.

On the basis of the findings of this chapter, a design of a fisheries management committee-based co-management structure for Lake Itzhi-Tezhi fishery has been suggested. Although the 'pre-assessment of co-management' approach and structure still need to be tested practically, the findings of this study have created a platform for further discussions, making of adjustments, and refining of the process by all the stakeholders and the actual implementation of the co-management arrangement.

Furthermore, this chapter suggests the establishment of a fisheries policy to give guidelines on some aspects to enhance the success of the implementation of co-management. One aspect is the establishment of the fisher-centred fishing village committees and fishing camp committees to enhance decision-making by fishers on matters of socio-economics, enforcement, monitoring and conflict resolution around the fishery. Decentralised power authority, and the suggested responsibilities for fishers and other stakeholders of the fishery, are additional aspects. The policy should explain the type of decentralisation to employ for the co-management arrangement and how to address the challenges in the implementation process. The type of decentralisation would either be devolution or delegation, depending on the capacities and capabilities of fishers and other stakeholders for each fishery. However, to delegate would be more appropriate, for a start, for the co-management at Lake Itzhi-Tezhi fishery, considering the capacity of the fishers and the government seeking to achieve true co-management that joins forces with relevant stakeholders.

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Chapter 7.

Synthesis, Conclusion and Recommendations

7.1. Introduction

This final chapter provides a summary of the dissertation, a synthesis of its findings, and its conclusions and recommendations. The summary and synthesis are based on each chapter and then aligned with the conceptual framework of the study, leading to its conclusion. The chapter provides a contribution to knowledge in the field of livelihoods, governance and fisheries co-management. The chapter also gives personal reflections on the subject of study and indicates the limitations faced by the researcher while undertaking the study. Finally, the study outlines suggestions for some future research that could be done in the field of fisheries co-management to consolidate and expand on the findings of this PhD project.

7.2. Summary, synthesis and conclusion

7.2.1. Study objectives

Over the past thirty years governance reforms, such as in fisheries co-management, have been driven by the fact that fisheries resources have been over-exploited or declining in many African inland fisheries governed by a top-down, centralised government system. Despite such a paradigm shift, most of these co-management reforms have still not provided solutions for governance problems in the African inland fisheries sector. Instead, they have produced mixed results depending on the different strategies and approaches taken by different countries. As such, this study contributes towards developing a practical approach to initiating a fisheries co-management arrangement for a small-scale fishery. The study addressed three research objectives, as indicated below.

- 1. To assess the contribution of small-scale fishing on Lake Itzhi-Tezhi to the livelihoods of local fishers' households, the extent of their exposure to vulnerability, the livelihood strategies employed, and the impact of legislation on these livelihoods.**

It is a well-documented fact that in many parts of Africa small-scale fishers depend on inland fisheries for their livelihoods (Food and Agriculture Organisation, 2016). The small-scale inland fisheries sector plays a cardinal role in the provision of food, nutrition, income and employment to sustain local livelihoods (Béné, Macfadyen, & Allison 2007; Welcomme et al. 2010; Weeratunge et al., 2014; Food and Agriculture Organisation, 2016). However, in the designing and implementation of co-management, the aspect of satisfying the livelihood needs of the fishers as a significant incentive has, in most cases, not been critically considered (Béné, Steel, Luadia, & Gordon, 2009; Weeratunge et al., 2014; De Graaf, Bartley, Valbo-Jorgensen, & Marmulla, 2015). Thus, this lack of livelihood consideration has been one of the main reasons for the failure of most co-management reforms (Westlund, Holvoet, & Kébé, 2008). The study used the sustainable livelihood approach to carry out a holistic assessment of livelihoods of fishers of the Lake Itzhi-Tezhi fishery (Chapter Four). This approach helped to clarify the importance of fishing income and other livelihood assets to the fishers, the impact of their vulnerability to unforeseen eventualities on their livelihoods, and the need for livelihood strategies for addressing their vulnerability.

The study revealed that strategies for enhancing fishers' livelihoods were strongly linked to a number of key aspects (Chapter Four). One of these aspects was to address the fishers' vulnerability through active collaboration with appropriate stakeholders to garner support for alternative livelihood ventures. The next was to put in place policies that are tailored to enhancing the fishers' livelihoods. The last one was to establish functional local governance structures that meet their livelihood needs. Ultimately, these aspects required a co-management type of governance to address them. To elaborate on this requirement, Chapter Five stressed the need for a legitimate governance process with all stakeholders and active collaboration among stakeholders for governance reforms that involve small-scale fishers if they were to succeed. The participation of different stakeholders in the governance of the fishery was critical as it would help in addressing the livelihood needs of the small-scale fishers through the use of their expertise and resources. This kind of stakeholders' participation was also emphasised in Chapter Six for the success of a co-management arrangement. Addressing the fishers' livelihoods was also highlighted as one of the cardinal drivers in promoting sustainable fishing of inland fisheries resources (Chapter Six).

Therefore, highlighting the significance of employing a holistic assessment of the livelihood needs of the small-scale fishers, before any implementation of co-management, is the contribution of this study to knowledge on the success of fisheries co-management. It entails that fishers' livelihoods should be well understood and prioritised in the planning process of a small-scale fisheries co-management arrangement. This holistic assessment of livelihood needs would ensure that the fishers' livelihoods are supported and catered for during the development of a co-management system. Having the fishers' livelihoods supported would further motivate their continued participation in the decision-making process of the co-management arrangement, thus enhancing stewardship of every stage of the process by the fishers.

2. To assess and analyse the current governance approach at the small-scale Lake Itzhi-Tezhi fishery and the sustainability of fishing practices by the fishers.

The inland fisheries in several African countries have generally been faced with fisheries resource over-exploitation. The cause of this has been linked to, among other things, weak governance systems in place for several fisheries (Carbonetti, Pomeroy, & Richards 2014). Weak governance was attributed to low participation from local fishing communities, limited extension services, inappropriate fisheries laws and regulations, inadequate enforcement of existing laws and regulations, weak institutions and institutional processes, lack of political will, and inadequate funds for implementing fisheries programmes (Ogutu-Ohwayo & Balirwa 2006; Ogello, Obiero, & Muguti 2013; Carbonetti et al., 2014). It has also been observed that approaches to governance, as in the case of fisheries co-management, usually raise conceptual and practical challenges in developing appropriate processes that are responsive, accord power-sharing arrangements, and can draw and act on multiple sources of knowledge (Nunan, 2010). As a result, assessing the governability of a specific fishery is usually helpful in identifying constraints on effective governance and improvements required in the governance process (Béné et al., 2009; Nunan, 2010).

In the case of the Lake Itzhi-Tezhi fishery, assessing the current governance approach of the fishery, based on the legitimacy criterion (Vatn, 2015), was done to understand its current strengths and weaknesses to help in the designing and implementation of a co-management type of governance arrangement. The current dual governance approach for the Lake Itzhi-

Tezhi fishery lacked legitimacy with small-scale fishers and other stakeholders and consequently did not have the support of stakeholders in its implementation and operation (Chapter Five). This situation might have contributed to the continued over-exploitation of the lake fishery's resources through unsustainable fishing practices.

The governance assessment revealed neither the government nor the local fishers were in a position to govern the fishery by themselves (Chapter Five). The governance process needed the participation of all the stakeholders of the fishery. For the success of such a governance process, its legitimacy with all stakeholders was of paramount importance as it was the means of enhancing accountability, transparency, participation, effectiveness, as well as benefit- and burden-sharing among fisheries' stakeholders. Furthermore, active collaboration among stakeholders was considered to be a critical aspect in promoting sustainable small-scale fishing of fisheries resources. Besides, prompt implementation of national fisheries legislation on local community participation, along with the establishment of an appropriate fisheries policy, was expected to promote active and collective participation of local fishers and other stakeholders in fisheries governance (Chapters Five and Six).

The key contribution to knowledge revealed in Chapter Five is that assessing the legitimacy of the existing governance structure among the key stakeholders in a particular fishery is paramount in creating a basis for the transformation of what is currently a non-functional fisheries governance approach. Based on such an assessment, this study revealed co-management as an alternative governance approach to the current predicament in governance at the Lake Itezhi-Tezhi fishery (Chapter Five). As such, the assessment and full understanding of the current governance system of the fishery was necessary before designing and implementing a co-management arrangement (Chapter Five). This understanding also helped to ascertain the capability and capacity of the fishery's stakeholders for adopting the reformed governance approach, namely the co-management arrangement in the case of Lake Itezhi-Tezhi fishery.

3. To explore the prospects of initiating a co-management approach with multiple stakeholders at Lake Itezhi-Tezhi fishery.

Co-management has been promoted as an alternative approach to the governance of Africa's inland fisheries. Various incentives played a role in the achievement of co-management. To

drive the co-management process, governments were driven by incentives, such as an increase in cooperation with the resource users, adequate levels of compliance with regulations among fishers, low costs of resource monitoring, increased capacity in enforcing laws and regulations, avoidance of conflicts among resource users, and possible reduction in fisheries resource depletion rates (Svendsrup-Jensen & Nielsen, 1998; Wilson et al., 2010). Enhanced means of conflict resolution among fisheries stakeholders, access rights for fishers to fisheries resources, enhanced livelihoods among fishers' households, and improved representation in decision-making concerning fisheries management and benefit-sharing (Svendsrup-Jensen & Nielsen, 1998), have been the fishers' incentives for participation in the co-management arrangement. Despite all this, use of unsustainable fishing practices by fishers and the over-exploitation of fisheries resources have continued in several inland African fisheries (Food and Agriculture Organisation, 2015; Haambiya, Kaunda, Likongwe, Kambewa, & Muyangali, 2015; Kosamu, 2017; Ogello et al., 2013; Welcomme et al., 2010).

Nevertheless, co-management results have been mixed depending on the legislative and policy frameworks of each country. Before 2011, Zambia's fisheries co-management reforms ended up as a failed project. This failure was mainly attributed to lack of legislation to support local community participation in decision making, incidences of conflicts among different parties involved, and a presence of substantial donor support (which is essentially an unsustainable approach as donor funds do not continue indefinitely), among other reasons (Haambiya, Kaunda, Likongwe, Kambewa, & Chama, 2016; Haambiya et al., 2015; Malasha, 2007; Mudenda, 1999). Even after the enactment of legislation that promotes co-management arrangements, nothing seems to have emerged based on the demands of that legislation.

The study has therefore shown that a participatory, learning-by-doing approach, based on the 'key conditions' for successful co-management, is an alternative way of designing a fisheries co-management arrangement for Lake Itzhi-Tezhi fishery (Chapter Six). The stakeholders of the small-scale lake fishery were firstly engaged and their perceptions collected on (i) the feasibility of co-management at the fishery, (ii) the expected challenges in the co-management implementation process, and (iii) the expected benefits from the process. These aspects were then aligned with appropriate 'key conditions' that could be used to address the expected challenges and realise the expected benefits. In the context of this study, this 'pre-assessment of co-management' process can be referred to as the 'key conditions approach'

(KCA) (Chapter Six). This contribution to knowledge, through the KCA, creates a basis for further discussions and interaction among stakeholders to address the missing ‘key conditions’ to refine every stage of the co-management process, and to strategise on the actual implementation of the co-management arrangement. The KCA and the stakeholders’ deliberation process that would follow would enable all the stakeholders, the small-scale fishers, in particular, the opportunity to participate fully in the planning, designing and implementation of the co-management arrangement, thereby enhancing responsibility and their ownership of the process. Achieving this is crucial for the sustainability of the fisheries co-management process.

In the case of the Lake Itzhi-Tezhi fishery, the findings through the KCA led to the designing of a tentative co-management governance structure consisting of all the appropriate stakeholders (Figure 6.2) with their fundamental roles and responsibilities spelled out explicitly (see Chapter Six, Section 6.3.1 for details). The structure has also created a platform for stakeholders of the fishery to begin applying their expertise. The structure would also enhance planning towards the implementation of the co-management arrangement at the Lake Itzhi-Tezhi fishery. All the required pieces of information needed to actualise the co-management process, such as legislation, appropriate policy, decentralisation criteria, additional roles and responsibilities for stakeholders, funding for the implementation process, constitution development for committees, findings from Chapters Four and Five, among other aspects, would be considered for discussion and passing of resolutions by all the stakeholders.

7.2.2. Fisheries co-management development framework

Consolidating the findings of Chapters Four, Five and Six creates a framework which the author refers to as the fisheries co-management development framework (FCDF). This framework is the ultimate contribution to the body of knowledge in terms of providing guidelines on the planning, organisational structure design, initiating the process, and eventual implementation of a co-management approach for the small-scale lake fishery (Figure 7.1).

The fisheries co-management development framework (FCDF) (Figure 7.1) hinges mainly on the institutional analysis and development (IAD) framework by Ostrom (1994). The starting point for initiating a co-management arrangement for a small-scale inland fishery is identifying the stakeholders to be engaged (Figure 7.1). Through a participatory and engagement process, perceptions would be derived from the stakeholders based on the fishery's identified problem(s) that need to be addressed through a co-management arrangement.

In the case of the Lake Itzhi-Tezhi fishery, the critical problem was the over-exploitation of the fishery's resources through unsustainable fishing. As such, the attributes of fishers' households and the rules and regulations that governed the fishery were linked to this problem of over-exploitation and unsustainable fishing (Figure 7.1). Based on these aspects, this study argued that detailed assessments of the livelihood status of fishers' households (Chapter Four and Figure 7.1) and the existing governance arrangement in the fishery (Chapter Five and Figure 7.1) were essential in the development of fisheries co-management for the small-scale lake fishery (Chapter Six and Figure 7.1). Such assessments were necessary because an understanding of fishers' livelihoods, one of the main drivers for the fishers' employment of different methods of fishing, would help to enhance the sustainability of the co-management process in the long term. Also, an understanding of the existing governance system at the fishery would help in creating a basis for initiating discussions and employing strategies towards co-management development by all stakeholders affected, especially the local fishing community and the government. The livelihood assessment should be done based on the sustainable livelihood framework (SLF) to evaluate the fishers' livelihood assets, their vulnerability to different shocks, stresses and seasonality, their livelihood strategies, and the impact of policy and legislation on their livelihoods (Chapter Four). The governance assessment should be done based on the legitimacy criterion that comprises accountability, transparency, participation, effectiveness, and benefit- and burden-sharing (Chapter Five). The impact of legislation and policy on the existing governance arrangement should be considered as it plays a vital role in the governance of fisheries resources at local and national levels (Chapter Five).

Use of the key conditions approach (KCA) is useful in conducting a pre-assessment of co-management to ascertain the feasibility and success of co-management when implemented

(Chapter Six and Figure 7.1). The outcome of the KCA is a co-management coordinating committee and a platform for onward discussions on the step-by-step development of the fisheries co-management arrangement (Figure 7.1). For the Lake Itzhi-Tezhi fishery, this study developed a governance structure called the Fisheries Management Committee (FMC) (Chapter Six, Figure 6.1), with specific roles for stakeholders outlined, to co-ordinate the activities of the co-management arrangement. This FMC would be expected to be going back and forth in its deliberations to address the expected challenges and to realise the expected benefits highlighted in the study (Chapter Six) during the implementation of a full-fledged co-management arrangement for the fishery.

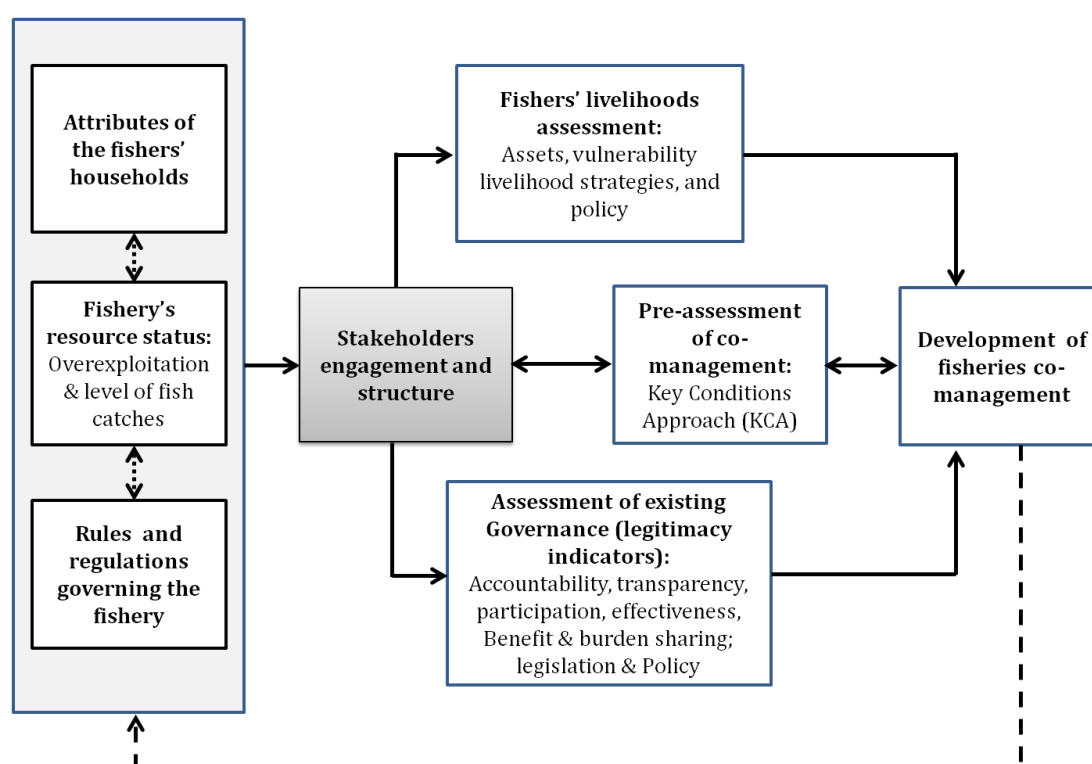


Figure 7.1: Fisheries Co-management Development Framework (FCDF) for small-scale inland fisheries

Adapted from Ostrom, 1994; Pomeroy and Williams, 1994; DFID, 1999; Vatn, 2015)

Ideally, the benefits of such fisheries co-management should trickle back to sustain the livelihoods of fishers' households and other attributes, fish catches per fisher, fishers' adherence to fisheries rules and regulations, use of sustainable fishing practices, and eventually, fish stock levels in the lake fishery (Figure 7.1).

In summary, the FCDF is a proposed framework that would help to guide the identification of critical problems at the fishery that need to be addressed through a co-management arrangement. The FCDF would assist in identifying the key stakeholders of the fishery, especially the local fishers, who would be engaged to provide their perceptions on the livelihood status of the fishers and the governance situation of the fishery. The outcome of such engagement would help in identifying the expected challenges that need to be addressed, and the expected benefits that are anticipated to be realised during the co-management implementation by aligning the challenges and benefits to the appropriate 'key conditions'. The stakeholders' engagement would help in developing the co-management coordinating structure and in identifying the stakeholders' roles and responsibilities in the structure. The framework ultimately helps to create a platform for the stakeholders to interact and deliberate on the successful implementation of the co-management at a fishery.

7.2.3. Beyond the Lake Itzhi-Tezhi fishery

The findings of this study present a scenario that seems to prevail among some fisheries within the country and other sub-Saharan African small-scale inland fisheries as regards the failure of the fisheries governance approaches implemented, such as co-management, to enhance sustainable fishing practices. Despite having legislation that supports local fishers' participation in governance, reluctance by governments to decentralise power and authority to them, through a deliberate policy framework, seems to be one such challenge. Therefore, the findings for this case study might also be useful in addressing such governance challenges faced by these African inland fisheries.

These findings also give support to the agreed instruments by FAO member countries, through the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication, on the development of sustainable fisheries (Food and Agriculture Organisation, 2015). Part 1 and section 5.15 of the FAO voluntary guidelines highlight the need for all member states to support the long-term conservation and sustainable use of fisheries resources and to maintain the ecological foundation for food production. The guidelines also emphasise the need for small-scale fishers to utilise fishing practices that minimise harm to the aquatic environment and associated species. Section 5.15 compels the member states to facilitate, train and support

small-scale fishers to participate in and take responsibility for the governance and management of the fisheries resources on which they depend for their livelihoods. Furthermore, member states should involve fishers in the designing, planning and implementation of participatory management systems for fisheries resources, such as co-management, following national laws.

Again, the findings give support towards meeting the United Nations Sustainable Development Goal 14 on sustainable fishing of fisheries resources (UN General Assembly, 2015). Section 14.4 of the SDG 14 focuses on effective regulation of harvesting and ending over-fishing, illegal, unreported and unregulated fishing and destructive fishing practices, and instead implementing science-based fisheries management plans by 2020. Section 14.7 focuses on increasing the economic benefits to developing and least-developed states from the sustainable use of fisheries resources through sustainable management of fisheries by 2030.

7.3. Insights

Central government and local fishing community alone cannot ensure the success of co-management

Various definitions for co-management have usually highlighted the fact that co-management entails the sharing of power and authority between government and the local people of a given community in the governance of natural resources. This study has demonstrated that local fishers cannot govern and manage the fisheries resources by themselves. Equally, the government could not effectively govern the fishery resources under study; hence, the call for a co-management arrangement. However, the study has shown that, besides the different arms of government and the local fishing community, specific key stakeholders should be part of the process for it to succeed. Given the limitation of government resources, these key stakeholders are essential in offering their expertise to the local fishers to enhance their livelihood strategies outside their fishing activities.

Holistic assessment of livelihoods of fishers' households is essential in the planning process for implementing a co-management arrangement

Fishers usually settle around water bodies to make a living out of their resources. This implies the fishers would not be motivated to support any intervention or project that would cut them off from the benefits of these resources. This study has therefore highlighted that a holistic assessment of the fishers' livelihoods is necessary to identify the livelihood components (assets, vulnerability, livelihood strategies and policies) that need to be attended to during the co-management implementation. Meeting the fishers' livelihood needs is one of the aspects that would guarantee their participating and supporting the achievement of the primary objective of the fisheries co-management process. This objective is about ensuring that the governance arrangement promotes the use of sustainable fishing practices by fishers, thus conserving fisheries resources for future generations and for contributing to the national economy.

Understanding the existing fisheries' governance approach is a springboard for designing a co-management structure for a given fishery

Fisheries co-management is a type of governance approach that brings different key fisheries stakeholders together to share power, authority, roles and responsibilities to manage the fisheries resources effectively and efficiently. Since the primary stakeholder is the local fishing community, there is a need to assess the legitimacy of the existing local governance structure in terms of accountability, transparency, participation, efficiency and the benefits accruing from it. The assessment should be done by engaging the same local fishing community and other key stakeholders so that they can buy into the process and see the need for transforming their system into a co-management type of governance. This process helps to enhance stewardship of the co-management process by the local fishing community.

Use of 'key conditions' for assessing the success of co-management based on stakeholders' perceptions is useful for planning purposes.

There is a need for stakeholders to identify the expected challenges to be addressed and the expected benefits to be realised during the actual implementation of the fisheries co-management arrangement by conducting a pre-assessment of the envisaged co-management.

To address the challenges and realise the benefits, they should be aligned with appropriate ‘key conditions’ for successful co-management. The alignment process is what creates a basis for deliberations, planning, designing and eventual implementation of the co-management arrangement by stakeholders. The ‘pre-assessment of co-management’ highlights critical areas to focus on during the process of planning and implementation.

Decentralisation of power and authority to the local fishing community is still a challenge for the central government.

Decentralisation of power and authority by the government to the local fishing community, either through delegation or devolution, is significant for the success of a co-management process. However, lack of decentralisation has been a critical issue in the implementation of co-management in several African inland fisheries, hence the inability of active participation of the local fishing communities in this process. Even in this study, decentralisation is one issue that might pose a problem in the execution of co-management as the sharing of power and authority was not spelt out in the enacted Fisheries Act (22 of 2011) (Government of Zambia, 2011) or any policy framework. Therefore, the government should endeavour, through a policy framework, to provide a workable roadmap for the decentralisation process to enhance proper implementation of the co-management arrangement and sustainable fishing by the fishers.

Central government’s prompt implementation of legislation that supports fisheries’ co-management structures is critical

One of the main hurdles in implementing fisheries co-management in Zambia has been the delay in actualising the enacted legislation that supports local fishing community participation in the governance of fisheries’ resources. Whatever has been the reason for that, it has probably further contributed to the over-exploitation of the fisheries resources experienced over the years in several water bodies. Fisheries resource over-exploitation is an indicator that local fishing communities have not been made responsible and accountable enough for these resources through a governance system such as co-management. This study has shown that prompt implementation and enforcement of such legislation by the government is essential to avoid further declines in fisheries’ resources. This process can be

done through the purposeful participation of the local fishers in decision-making and benefit-sharing when it comes to the fisheries' resources.

Women's contribution to the generation of fishers' household income must be recognised and supported by policy

Women in the fisheries sector have been seen to make a considerable contribution to the livelihoods of fishers' households in fishing communities. Despite this contribution, though, there has not been enough support to lighten the financial burden of male fishers' effects in making ends meet for their households. It was the same situation in the lake fishery under study. Therefore, fish trading done by women should be recognised and legally supported through a policy framework. This recognition would enable them to access credit to help them venture into seeking other sources of income, thus providing alternative livelihood coping strategies for the household throughout the year. However, building the capacity of women in business ventures should go along with this recognition and support, as most of the women in the fisheries are usually poorly educated.

Need for a standalone fisheries policy framework

The Zambian fisheries sector has had no standalone fisheries policy to provide direction to the operations of the sector. The sector has mainly depended on other policies used by other line ministries, with some fisheries-related components in them, to carry out its mandate of managing and conserving the fisheries' resources. This study has argued that the lack of a fisheries policy could have contributed to the reluctance by the government to implement the requirements of the Fisheries Act (22 of 2011) (Government of Zambia, 2011), that is, local fishing community participation in fisheries resource governance and management. A standalone national fisheries policy is, therefore, indispensable to specify in detail critical aspects of fisheries governance, such as the designing and implementation process of the fisheries co-management as highlighted in this study.

Critical in the co-management governance process is addressing the fishers' livelihoods. As such, this study has argued for a fisheries policy that incorporates components that would promote the enhancement of fishers' livelihoods through active participation of appropriate stakeholders, besides government, with their expertise and resources to address this issue. If

various sources of livelihood could be created, this would foster sustainable fishing by the fishers.

7.4. Experiences, limitations and reflections

1. The actual population of fishers in the fishery was not known. With the help of the research assistants, the researcher visited almost 40 fishing camps and fishing villages to establish their approximate population. The process depended on registers that were kept in some fishing camps, since the actual fishers were not present in some of them at the time. Fishers had travelled to sell their fish in Itezhi-Tezhi and other towns as the lake had just been opened for fishing. Fishers were desperate to raise money for their households. Other fishers had gone to the lake to set their fishing nets. In some other fishing camps the researcher depended on the knowledge of the chairperson or representative to give him an approximate number for the fishing camp. In the fishing villages the researcher depended on the headmen or their representatives for such information, as they knew who the fishers were. The estimated population of fishers was the basis on which the researcher determined the sample size. The process helped the researcher to capture the target group, the fishers, for conducting focus group discussions and face-to-face interviews via questionnaires.
2. It was challenging to find the fishers in some of the fishing camps at the time of data collection. Focus group discussions were conducted towards the end of March. It was just after the end of the closed fishing season and fishers were desperate to sell their fish to supply food to their families. Some fishing camps were almost vacant as everyone had moved out. As a result, of the 40 fishing camps and fishing villages targeted for random sampling, only 19 were found to have fishers present. Purposeful sampling was the only meaningful option to select the total sample size of 12 fishing camps and fishing villages.
3. Of the targeted key stakeholders, 3 were not available or were not reachable for interviews, i.e. the community development official, the traditional affairs official, and a politician. Therefore, the researcher could not collect valuable data from these persons for analysis.

4. The PhD study accorded the researcher the opportunity to use the Open Data Kit software for collecting data through questionnaires electronically. It was the most efficient and quickest way of collecting and storing raw data electronically. The use of hard copies was not required in this case. The researcher would, therefore, recommend other researchers to use such devices for their data collection.
5. The researcher gave feedback to, and shared knowledge with, several stakeholders, academics and funders through published peer-reviewed articles, stakeholder workshops, annual technical meetings, academic seminars, conferences and a colloquium. These helped the researcher to share the knowledge gathered through the study with a broader audience in his field of study.
6. Use of the sequential mixed-methods approach for this case study was beneficial as it helped the researcher to capture different types of data and compare them for their reliability and validity. The researcher was able to easily compare and contrast data collected from the same sample through questionnaires and focus group discussions. The researcher further verified the data through interviews. Therefore, it was easy to check whether the data gathered was reliable and valid. The researcher would, therefore, recommend the use of a mixed-methods approach for such studies in future.

7.5. Future research

The study has demonstrated the need for a more participatory approach in addressing the ‘key conditions’ highlighted for initiating the co-management arrangement on the Lake Itzhi-Tezhi fishery. Given the conclusions arrived at, the experiences acquired, and the limitations encountered during this PhD project, some areas for future research have been highlighted to consolidate this study’s findings towards developing a successful and sustainable co-management arrangement.

1. This study focused on assessing the contribution of fishing income to the fishers’ household livelihoods, their vulnerability, and the livelihood strategies employed to mitigate their vulnerability. Comparative research can be conducted to ascertain the levels and impact of poverty among the fishers and non-fishers residing within the vicinity of the lake fishery. The findings would help to give a complete picture of the

impact of different sources of livelihoods and poverty levels of the people around the fishery to inform policy-making.

2. This study has established some ‘key conditions’ that need to be addressed and realised to enhance a successful co-management arrangement for the Lake Itzhi-Tezhi fishery through the ‘key conditions approach’ and the fisheries co-management development framework (FCDF). The establishment of the ‘key conditions’ was done through a short-term, consulting transdisciplinary (TD) approach involving different stakeholders. In the long term, incorporating a participatory transdisciplinary (TD) approach would be more appropriate for this undertaking, as it is a learning-by-doing, co-knowledge gathering, co-designing and co-developing approach that deals with adaptive and complex systems such as small-scale fisheries. Co-management itself is an adaptive process in implementation, hence the need for a long-term and detailed TD approach.
3. A more or less similar study site as the current study site is found on Lake Tanganyika, on the Zambian side, where a portion of the lake lies in the Nsumbu National Park with game management areas (GMAs) around it. Since results from a case study cannot be generalised, a similar approach used in this research could be employed in another case to compare findings. The findings on Lake Tanganyika would further strengthen the results of this study in terms of policy recommendations.
4. Even though migration of fishers to the Lake Itzhi-Tezhi fishery was seen as one of the causes for a reduction in fish catches per fisher, there is still a need to investigate the drivers of such massive migration to find a well-researched solution to it. The findings would also help to inform policy on the matter.
5. Government’s lack of drive to promptly implement pieces of legislation that support co-management seemed to be a serious concern expressed by some key fisheries stakeholders. Further research could be carried out to explore the real causes of this lack of drive and the possible solutions to this problem. An investigation can also be done on the actual reasons for the reluctance by the government to relinquish part of its power and authority to the local fishing community for the implementation of fisheries co-management. These two aspects have been a hurdle to the execution of co-management in the fisheries of Zambia since 2011.

6. There is need for more quantitative data on supply and demand in the Itezhi-Tezhi fishery i.e. on total off-take, size classes, etc verse fish population dynamics, especially trends in total population and in size classes, as well as recruitment.
7. There still need to conduct a livelihood study among the small-scale fishers at Itezhi-Tezhi fishery that focuses on determining the fishers' total income derived from various sources against the actual contribution of fishing income to their livelihoods. A comprehensive vulnerability assessment that covers the exposure, susceptibility and adaptability of fishers to vulnerability can also be conducted to ascertain the full extent of fishers' vulnerability to shocks, stresses and seasonality.

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Appendices

Appendix A: Survey questionnaire

<p style="text-align: center;">SURVEY QUESTIONNAIRE</p> <p style="text-align: center;">≈USED WITH THE OPEN DATA KIT SOFTWARE≈</p>

Name of Interviewer:.....

Date:.....

Survey No.:.....

Name of Fishing Village or Fishing Camp:.....

STATEMENT ABOUT INFORMED CONSENT:

VERBAL SCRIPT PRESENTATION TO PARTICIPANT SEEKING CONSENT

VERBAL SCRIPT PRESENTATION TO PARTICIPANT SEEKING CONSENT

Sydney Kapembwa is a research student at Stellenbosch University, South Africa, and a Lecturer at Copperbelt University, Kitwe. His supervisor for this research is Prof. Alan Gardiner from Southern African wildlife College, South Africa and his Co-supervisor is Prof. Jón Geir Pétursson, University of Iceland, Zambia. He is conducting a research project entitled **“Towards co-management of small-scale fisheries resources and livelihood: A case of Lake Itzhi-Tezhi, Zambia”**. This study has been **approved by the Humanities Research Ethics Committee (HREC) at Stellenbosch University and will be conducted according to accepted and applicable national and international ethical guidelines and principles.**

Together with him, we are, currently, conducting a survey in your fishing community. We would, therefore, be very grateful if you would answer a few questions about how you look at the status of the fisheries in your water body, the way the fishery has been managed, how your livelihood has been impacted by the current status of the fisheries, your relationship with other stakeholders in the conservation of the fisheries resources, and your opinion on the way forward to make things better if, at all, you feel they are not as you expect them to be. This research is aimed at helping promote good community-based governance in the conservation of the fish stocks in Lake Itzhi-Tezhi.

Nevertheless, your participation is entirely voluntary. You are also at liberty to withdraw at any point during the interview even if you agree to participate. The interview will last about 1 hour. You do not have to answer any question you are not comfortable with. You can ask for clarification on any question at any time. By the way, there will be no payment for participating in the interview. It's purely voluntary. The collected data will be kept by the Directorate of Information and Communication Technology (DICT), Copperbelt University, Zambia, for your confidentiality. As a consequence of this survey, the analysed and documented results, with the intention of being published, will be communicated to you in due course through your community representatives, but you will be kept anonymous if you so wish. All in all, the information you will provide will be kept strictly confidential.

In the light of this background, do you agree to be interviewed? If yes, is this an appropriate time?

1. Respondent's personal profile

- 1.1 Gender: 1) Male 2) Female
- 1.2 Ethnic group: 1) Ila ☐ 2) Tonga ☐ 3) Lozi ☐ 4) Kaonde ☐ 5) Luvale ☐ 6) Lunda 7) Bemba 8) Others (Specify):.....
- 1.3 Age: 1) 18 – 25 years 2) 26 – 40 years 3) 41 – 55 years 4) <55 years
- 1.4 Marital status: 1) Married 2) Single 3) Widow 4) Widower
- 1.5 Are you the head of the household? 1) Yes 2) No
- 1.6 Education background:
- 1) Primary education 2) Secondary education 3) Tertiary education 4) None

2. Geographical location and duration of stay

- 2.1 Name of chief where you live around this Lake:
- 2.2 Name of the village where you live around this Lake:
- 2.3 Name of fishing camp (for the fishers):.....
- 2.4 Were you born in this village? 1) Yes 2) NO
- 2.5 If **YES**, how long have you lived here?
- 1) < 1 year 2) 1 – 5 years 3) 6 – 10 years 4) 10 – 20 years 5) >20 years
- 2.6 If **NO**, which village or town do you come from?.....
- 2.7 How long have you lived here since you came?
- 1) <1 year 2) 2 – 5 years 3) 6 – 10 years 3) 10 – 20 years 3) >20 years
- 2.8 If you have stayed in the village for less than six months, do you just come during the fishing season and you normally go back to your home village after the fishing season?
- 1) Yes 2) NO
- 2.9 Why did you leave or do you leave your home village to come here?
- 1) Need for more income
- 2) No more enough fish in the lake or river in the home village
- 3) Conflicts with other fishers
- 4) Felt like do fishing elsewhere
- 5) Others (specify them)
-
-

3. Household Assessment

- 3.1 Indicate the total number of people in the household:
-

3.2 Details for each member of the Household

(Tick where appropriate)

Member (Relationship with head of Household)	Sex	Age	Education level	Marital status	Does this person live here:	Is he/she involved in any fishing related activities in this house? If YES, which ones?	What is his/her other job, if not involved in the fishing business?	What is his/her income per month from the job, if any?	Does he/she get any government grant or help? 1) Yes 2) No If yes, which one?	How much is he/she given per month?	How often in a year?
Wife/ Husband	M	<18	None	Single	Full time (every day, 12 months of the year)	Fish harvesting	Scholar/student	Less than K500 (3 tabs)	Child support	< K100	once a month
	F	18 - 25	Some primary	married	Part-time (some days of the month, or some months of the year)	Fish processing	Employed: Full-time	K501 - K1,000 (3 - 7 tabs)	Foster care	K100 - K300	once every 2 months
		26 - 40	Completed primary	widow	Visiting	Net mending	Employed: Part-time	K1,001 - K2,000 (8 - 14 tabs)	Disability	K301 - K500	once a quarter
		41 - 55	Some secondary	widower		Fish selling	self-employed (active farmer)	K2,001 - K3,000 (15 - 21 tabs)	Pension	K501 - K1000	twice a year
		>55	Completed Secondary	Divorced		Fishing buying	Self-employed (e.g. own business or trader): Full- time	K3,001 - K5,000 (22 - 35 tabs)	Social cash transfer	K1001 - K2000	once a year
			College			Fish buying and selling	Self-employed (e.g. own business or trader): Part- time	K5,001 - K10,000 (36 - 70 tabs)	Youth empowerment	> K2001	Others
			University			Boat Repairing	Pensioner / too old to work	Above K10,000 (71 tabs)	Others	Not sure	
						None	too young to work	Not sure			
						Others	Unemployed (not including scholar, pensioner) or self- employed)				

3.3 Household Assets - Housing

S/No.	Type of Housing	Tick the number of buildings with these characteristics
1.	Pole and mud walls with thatched huts	1,2,3,4,5,6,7,8,≥9
2.	Structure with unburnt bricks with thatched roof	1,2,3,4,5,6,7,8,≥9
3.	Structure with unburnt bricks with iron sheets	1,2,3,4,5,6,7,8,≥9
4.	Structures with burnt bricks and iron sheets	1,2,3,4,5,6,7,8,≥9
5.	Modern house (with cement blocks and iron sheets)	1,2,3,4,5,6,7,8,≥9

3.4 Type of toilet that is used by the family or has access to

- 1) Improved pit latrine – with ventilation (VIP)
- 2) Cultural toilet/ pit latrine
- 3) None

3.5 What is the main water source for drinking?

- 1) Water in house/ standpipe
- 2) Public/Shared standpipe ☐
- 3) Well/borehole
- 4) River/stream/creek
- 5) Other

3.6 Other Household Assets

S/No.	Asset owned by Household	Tick the number of each of these assets
1.	Car	1,2,3,4,5,6,7,8,≥9
2.	Bicycle	“
3.	Motorbike	“
4.	Canoe or Boat	“
5.	Sledge (Chilayi)	“
6.	Plough	“
7.	Cart (Chikochi)	“
8.	Hunting equipment (Spear, knife, axe, etc)	“
9.	Radio	“
10.	Television	“
11.	Cell phone	“
12.	Solar panels	“
13.	Fishing net	“
14.	Boat engine	“

15.	Drum	“
16.	Other fishing equipment (Spear, Knife, etc)	“
17.	Stove	“
18.	Bed	“
19.	Chairs/Sofa	“
20.	Others	“

If OTHERS, specify with numbers for each

.....

.....

3.7 Sources of energy and their uses

S/No.	Energy source	Tick on the energy source for household	Tick on the uses for the energy source you have selected			
1.	Wood		Cooking and boiling water		Lighting	
2.	Paraffin		Cooking and boiling water		Lighting	
3.	Charcoal		Cooking and boiling water		Lighting	
4.	Electricity for generator		Cooking and boiling water		Lighting	
5.	Solar		Cooking and boiling water		Lighting	
6.	Car battery		Cooking and boiling water		Lighting	
7.	Torch battery		Cooking and boiling water		Lighting	
8.	Candles		Cooking and boiling water		Lighting	
9.	Gas		Cooking and boiling water		Lighting	
10.	Cow dung		Cooking and boiling water		Lighting	

3.8 Health, Nutrition and Food Security

S/No.	Meals	Select the meals which the household eats	How often do you eat these meals which have been selected? (Tick on the appropriate?)				
			Daily	Weekly	Monthly	Yearly	Never
1.	Maize (meal, fresh)						
2.	Bread						
3.	Legumes (peas, beans)						
4.	Rice						
5.	Fish						
6.	Chicken						

7.	Vegetables						
8.	Meat (beef, goat, pork)						
9.	Game Meat						
10.	Fruits						
11.	Ground Nuts						
12.	Pumpkins						
13.	Eggs						
14.	Milk products						
15.	Sugar						
16.	Sweet Potatoes						
17.	Cooking Oil						
18.	Sorghum						
19.	Honey						
20.	Cassava						
21.	Millet						
22.	Others						

3.9 How much on average do you spend on buying food stuffs (listed above) for household per month?

- 1) <K500 2) K500 - K1,000 3) K1,001 – K3,000 4) K3,001 – 5,000 5) >K5,000 - K10,000 6) >K10,000

3.10 How much on average do you spend on medicines and medical care (traditional medicines inclusive) per year?

- 1) <K500 2) K500 - K1,000 3) K1,001 – K3,000 4) K3,001 – 5,000 5) >K5,000 - K10,000 6) >K10,000

3.11 How much on average do you spend on talk time, water, electricity sources, and transport per month?

- 1) <K500 2) K500 - K1,000 3) K1,001 – K3,000 4) K3,001 – 5,000 5) >K5,000 - K10,000 6) >K10,000

3.12 How much on average do you spend on school fees per year?

- 1) <K500 2) K500 - K1,000 3) K1,001 – K3,000 4) K3,001 – 5,000 5) >K5,000 - K10,000 6) >K10,000

3.13 How much on average do you spend on drinks and alcohol per month?

- 1) <K500 2) K500 - K1,000 3) K1,001 – K3,000 4) K3,001 – 5,000 5) >K5,000 - K10,000 6) >K10,000

3.14 Over the past 12 months, has your household experienced shortage of food?

- 1) Yes 2) No

3.15 If yes, in which months?

S/No.	Months	Tick on the months experienced food shortage
1.	January	
2.	February	
3.	March	
4.	April	
5.	May	
6.	June	
7.	July	
8.	August	
9.	September	
10.	October	
11.	November	
12.	December	

3.16 If YES, what was the most common cause of food shortage in your household?

- 1) Low fish catches
- 2) Poor fish sales
- 3) Fishing ban enforcement
- 4) Problem with DoF or ZAWA
- 5) Fish thefts
- 6) Others, specify them

.....

3.17 What are the major health concerns in your family? (Tick where appropriate)

- 1) HIV/AIDS
- 2) Malaria
- 3) Diarrhoea
- 4) Malnutrition
- 5) TB
- 6) Others, specify them

.....

3.18 Access to Community Facilities

Do you have easy access to the following facilities or resources?

S/No.	Community facilities	Select YES or NO	
1.	Schools for your children		
2.	Clinics or Hospitals		
3.	Clean drinking water e.g. boreholes, treated water		
4.	Religious centres e.g., church, mosques, kingdom hall, etc		
5.	Community meeting centres		
6.	Market centres for your produce		

7.	Your own piece of land		
8.	Your own house		
9.	Transport e.g. boat, ox cart, bicycle, motorcycle, car, lorry		
10.	Schools for your children		
11.	Good road network to places		

4. Fisheries resources status

4.1 Which fishing-related activities are you involved in?

- 1) Fish harvesting
- 2) Fish processing (cleaning, drying, smoking, salting, etc)
- 3) Net mending
- 4) Fish selling
- 5) Fish buying and selling
- 6) Boat Repairing
- 7) Others

If OTHERS, specify.....

4.2 How long have you been catching fish from the lake or how long have you been involved in fishing-related activities in this lake?

- 1) Less than 1 year
- 2) Between 1 - 5 years
- 3) Between 6 - 10 years
- 4) Between 11 - 15 years
- 5) Between 16 - 20 years
- 6) Above 20 years

4.3 How are the fish catches, in terms of the number of buckets per harvest on a particular day, now as compared to the year you started your fishing business?

- 1) Very high 2) High 3) Same 4) Low 5) Very Low 6) Not sure

4.4 How long was it taking you (days) to catch (number of tabs per catch) and take fish for sale from the time you started your fishing business?

.....

4.5 How long does it take you (days) to catch the same amount of fish now?

.....

4.6 Which period in a year are the catches of fish the most?

- 1) Soon after the fishing ban 2) Soon after the cold season 3) Just before the fishing ban

4.7 If catches, in terms of the number of tabs or buckets of fish per catch on a particular day, have reduced from the time you started your fish business, what do you think could have led to the decline in fish catches?

- 1) Too many fishers fishing now than before

- 2) Use of wrong fishing gears
- 3) No proper enforcement of the fishing ban by DoF
- 4) Fishers fishing too much now than before
- 5) Low water levels in the Lake
- 6) Others (specify):.....

4.8 What is your opinion about the status of fish stocks in the lake from the time you started your fishing business on this lake? (Tick where appropriate)

	Increased	Same	Decreased	Not sure
Abundance of fish catches				

5. Livelihood status in relation to fishing activities

5.1 What have you been doing with the fish caught or bought?

- 1) Selling only 2) Consumption only 3) Selling and consumption

5.2 If you have been selling, how have been the sales of fish?

- 1) Very good 2) Good 3) Average 4) Bad 5) Very Bad

5.3 If BAD or VERY BAD, what could be the reason (s)?

- 1) Low fish catches 2) Low fish demand within community 3) High transport costs to other markets 4) Plenty of fish on markets in other towns 5) Others

If OTHERS, specify):.....

5.4 Where have you been selling your fish?

- 1) Within the fishing community 2) Itezhi-Tezhi town 3) Outside Itezhi-Tezhi town 4) To fish traders 5) Others (Specify):.....

5.5 What could be your average income per month from your fish catches (Number of buckets of fish sold)?

- 1) <K500 2) K500 - K1,000 3) K1,001 – K3,000 4) K3,001 – 5,000 5) >K5,000 - K10,000 6) >K10,000

5.6 How is it now as compared to the time you started selling fish?

- 1) Increased 2) Slightly increased 3) Same 4) Slightly decreased 5) Decreased

5.7 What are your other sources of income **DURING THE FISHING SEASON**?

- 1) Fish farming 2) Crop/vegetable farming 3) Livestock farming 4) Beekeeping 5) Buying and selling of other goods 6) Employment 7) Others

If OTHERS, specify):.....

5.8 What are your other sources of income **DURING THE FISHING BAN?** (*If more than one, arrange them in order of importance to you*).

- 1) Fish farming 2) Crop/vegetable farming 3) Livestock farming 4) Beekeeping 5) Buying and selling of other goods 6) Employment 7) Others

If OTHERS, specify:.....

5.9 Do you feel fish farming can be a better alternative to catching fish from the Lake?

- 1) Yes 2) No 3) Not sure

5.10 If **YES**, why do you feel it could be a better alternative?

- 1) Can reduce fishing pressure on Lake
2) Can supplement the low catches from the Lake
3) Can create self-employment for the fishing community
4) Can create additional income
5) Can be a major source of income during the fishing ban
6) Others (Specify):.....

5.11 If crop or vegetable farming has been your other source of income, which crops have you been growing?

S/No.	Crop/Vegetable	Select the ones which have been your source of income (Tick)
1.	Maize	
2.	Sorghum	
3.	Millet	
4.	Cassava	
5.	Sunflower	
6.	Beans	
7.	Groundnuts	
8.	Sweet potatoes	
9.	Watermelons	
10.	Tomatoes	
11.	Rape	
12.	Cabbages	
13.	Impwa	
14.	Onion	
15.	Sugarcane	
16.	Others	

If OTHERS, specify:.....

5.12 What has been your average income through crop or vegetable farming per harvest per year?

- 1) <K500 2) K500 - K1,000 3) K1,001 – K3,000 4) K3,001 – 5,000 5) >K5,000 - K10,000 6) >K10,000

5.13 What has been your main challenges in crop/vegetable farming?

- 1) Poor rainfall

- 2) Crop pest (e.g. mice or insects)
- 3) Crop disease
- 4) Too much rain
- 5) Livestock eating & trampling
- 6) Theft
- 7) Expensive inputs
- 8) Problem with wildlife
- 9) Poor extension services
- 10) Others

5.14 If livestock rearing has been your other source of income (also), which animals have you been keeping?

S/No.	Livestock	Select the ones which have been your source of income (Tick)
1.	Cattle	
2.	Goats	
3.	Pigs	
4.	Sheep	
5.	Donkeys	
6.	Chickens	
7.	Ducks	
8.	Pigeons	
9.	Others	

5.15 What has been your average income through livestock rearing per harvest per year?

- 1) <K500
- 2) K500 - K1,000
- 3) K1,001 – K3,000
- 4) K3,001 – 5,000
- 5) >K5,000 - K10,000
- 6) >K10,000

5.16 What have been your main challenges in livestock rearing?

- 1) Disease outbreaks
- 2) Problem with predators
- 3) Expensive drugs
- 4) Theft/escape
- 5) Not enough food
- 6) Not enough water
- 7) Poor extension services
- 8) Others

6. Existing governance structure and community participation in sustainable fishing of fisheries resources

6.1 Do you feel that fish should be sustainably harvested from the Lake by fishers?

- 1) Yes
- 2) No
- 3) Not sure

6.2 If **YES**, why should it be sustainably harvested?

- 1) Access by future generation also
- 2) More income
- 3) More food
- 4) More fish in Lake

5) Others (Specify):.....

6.3 Who is responsible for ensuring sustainable harvesting of the fish from the Lake?

- 1) ZAWA only 2) DoF only 3) ZAWA & DoF 4) ZAWA, DoF & traditional leaders 5) ZAWA, DoF, traditional leaders & fishing community 6) DoF, Traditional leaders & fishing community 7) ZAWA, traditional leaders & fishing community 8) Others

If OTHERS, specify:.....

6.4 How satisfied are you that those responsible are making sure that fish is sustainably harvested from the Lake?

- 1) Very satisfied 2) Satisfied 3) Average 4) Unsatisfied 5) Very unsatisfied

6.5 If SATISFIED, give reasons for your satisfaction.

.....

6.6 If UNSATISFIED, give reasons for your dissatisfaction.

.....

6.7 Do you feel you should be personally involved in ensuring that fish is sustainably harvested from the Lake?

- 1) Yes 2) No 3) Not sure

6.8 Do you belong to some Associations or Committees in your fishing community?

- 1) Yes 2) No 3) Not sure

6.9 If Yes, which one(s)? (Tick where appropriate)

- 1) Farmers or Livestock Cooperative
- 2) Fishermen and Traders Association
- 3) Village wildlife committees (CRB and VAGS)
- 4) Traditional Association/Committee
- 5) Church or any religious group committee
- 6) Political group committee
- 7) Village committee e.g. CDF, water committee, neighbourhood watch group, etc
- 8) Cultural group or association, e.g. choir, debating, dancing
- 9) Education group, e.g. school governing body, PTA
- 10) Health group e.g. home-based care, traditional healers association, NHC
- 11) Youth or sports group
- 12) Others

If OTHERS, specify:.....

6.10 How active are you, in terms of participation, in the activities of this or these Associations/Committees to which you belong?

- 1) Very active 2) Active 3) Average 4) Inactive 5) Very inactive

- 6.11 Are you aware of the existence of an Association for fishermen and fish traders which looks at the management and conservation of the fish in the Lake and the wellbeing of the fishers and fish traders in the community?
1) Yes 2) No 3) Not sure

If NO or NOT SURE, go straight to question 6.23

- 6.12 How satisfied are you with manner people are elected in their positions in the Association?
1) Very satisfied 2) Satisfied 3) Average 4) Unsatisfied 5) Very unsatisfied
- 6.13 How satisfied are you with the work of the Association in helping to prevent fish from finishing in the Lake?
1) Very satisfied 2) Satisfied 3) Average 4) Unsatisfied 5) Very unsatisfied
- 6.14 Is the Association involved in coming up with projects in the community to help improve the livelihood of the people?
1) Yes 2) No 3) Not sure
- 6.15 If **YES**, what kinds of projects have been brought into the community by the Association?
.....
- 6.16 How satisfied are you with the way the money raised through your contributions is spent by the Association?
1) Very satisfied 2) Satisfied 3) Average 4) Unsatisfied 5) Very unsatisfied
- 6.17 Does the Association have a constitution to guide its operations and the responsibilities of its members?
1) Yes 2) No 3) Not sure
- 6.18 How much do you know about what is in the constitution of the Association?
1) Everything 2) Most of them 3) Little about it 4) Nothing
- 6.19 How often does the Association call for meetings in a year?
1) Once a month 2) Once a quarter 3) Once a year 3) Not at all 4) No idea
- 6.20 If meetings are held, how often do you attend?
1) Always 2) Sometimes 3) Rarely 4) None
- 6.21 If you attend, how satisfied are you with the way your decisions are taken in these meetings?
1) Very satisfied 2) Satisfied 3) Average 4) Unsatisfied 5) Very unsatisfied
- 6.22 Are you also involved in the decision making on how projects are implemented by the Association?
1) Yes 2) No 3) Not sure
- 6.23 If NO, are you in support of the existence of the Association as a means of helping to manage and conserve the fish in the lake and one where you can also fully participate?
1) Yes 2) No 3) Not sure

THIS IS THE END OF THE QUESTIONNAIRE.

THANK YOU FOR SPARING ME YOUR TIME TO ANSWER THE QUESTIONS

Appendix B: Focus group discussion schedule for fishers

1.0 STATUS OF THE FISHERIES RESOURCES IN RESEARCH SITES

- 1.1 From your point of view, how do you compare the fish catches from the Lake between now and 5 years ago?
- 1.2 What has been your attitude in view of the prevailing levels of fish catches been now and 5 years ago?
- 1.3 If the fish catches have declined or increased over the years, what could be the possible reasons for that?
- 1.4 How has been your interaction with fishers from other areas outside Lake Itzhi-Tezhi fishing community?
- 1.5 How has been the market of the fish and in what state is the fish normally sold to consumers? Any challenges that you have been facing in the selling of the fish?

2.0 HOUSEHOLD LIVELIHOODS

- 2.1 If there has been a decline or increase in fish catches by the fishing activities, has this affected your livelihoods? In what way has this affected their livelihoods?
- 2.2 Are you involved in any alternative sources of income? Has it been easy for you to do that as fishers? Are they done according to gender? How has that been done, if any?
- 2.3 Are there some proposed alternative sources of income proposed by govt or any other organisation in the fishing community? Are there things that need to be put in place before you can easily take up the proposed alternative sources of income? What are they if any?
- 2.4 Are there adequate social services, e.g., medical centres, schools, markets, transport system, churches, clean water facilities, etc, in the fishing community that enhance better livelihood? Itemise them. What is your view with regard to these services and what do you suggest could be the way forward?

3.0 GOVERNANCE OF FISHERIES RESOURCES AND COMMUNITY PARTICIPATION

- 3.1 Are you aware that you are supposed to harvest fish sustainably? If any, to what extent have you been involved in the use of acceptable fishing practices and helping in fisheries laws enforcement?

- 3.2 Does the fishing community have an Association or Committee that are responsible for ensuring that fish is sustainably harvested? If any, what has been the composition of these committees and their main roles in promoting acceptable fishing practices and fisheries laws enforcement?
- 3.3 How has been the selection process of the members in this Association or Committee? Have they been organising meetings and what have been the outcomes from these meetings?
- 3.4 What has been the source of funds for activities by the association or Committee? Have the members of the Committee been accountable for those funds? Have you been involved in decision making in the use of funds for activities and projects by the association or Committee?
- 3.5 Have you been satisfied with the level of organisation of this Association or Committee and their promoting acceptable fishing practices and law enforcement and improving the livelihood of the fishers? What is your comment?
- 3.6 What has been the input of traditional leaders in the decision-making process of this Association or Committee? What is your opinion?
- 3.7 What are your observations with regard to the level of participation of the whole fishing community in the use of acceptable fishing practices and fisheries laws enforcement so as to conserve fish in the lake?
- 3.8 Would you support your full participation as opposed to full government control in promoting acceptable fishing practices and fisheries laws enforcement so as to conserve fish in the lake? What are your comments?
- 3.9 What could be the possible positive and negative impacts of your full participation in fisheries conservation activities and your livelihood improvements, if given the chance?
- 3.10 Are you aware of any law that supports your full participation in the use of acceptable fishing practices to conserve fish in the lake?

4.0 STAKEHOLDER PARTICIPATION IN FISHERIES RESOURCES CONSERVATION

- 4.1 Which other organisations do you know that are involved in making sure that fish does not finish in the lake? What do they do exactly?

4.2 How satisfied are you with their activities in ensuring that fish is sustainably harvested by fishers?

4.3 How satisfied are you with collaboration between the fishing community and the other stakeholders in promoting the use of acceptable fishing practices and fisheries laws enforcement to conserve fish?

5.0 POSSIBILITY OF INITIATING CO-MANAGEMENT GOVERNANCE OF FISHERIES RESOURCES

5.1 Without the help of government and other stakeholders, can you local fishers alone manage and conserve fish in the lake through use of acceptable fishing practices and participation in fisheries laws enforcement? Give reasons for your answer.

5.2 What role should stakeholders (each one is mentioned here) play to help fishers to effectively participate in the management and conservation of fish in the lake through a co-management arrangement and structure?

5.3 What kind of benefits do you intend to get through your participation in the management and conservation of fish in the lake? Do you feel benefits from the conserved fish in the lake will motivate you to put in your best in managing and conserving that fish through the use of acceptable practices and participation in fisheries law enforcement?

**THANK YOU VERY MUCH FOR YOUR PARTICIPATION IN THE
DISCUSSION**

Appendix C: Interview schedule for key stakeholders

(Department of Fisheries, Department of National Parks and Wildlife, Traditional leaders, Fishermen and Fish Traders' Association, NGO, and Informants)

1.0 INTRODUCTION

- 1.1 How long have you been working for your organisation?
- 1.2 What are your responsibilities in your organisation?
- 1.3 How long have you been working with the fishing community around Lake Itezhi-Tezhi?
- 1.4 What has been your work with this fishing community?

2.0 STATUS OF THE FISHERIES RESOURCES AND FISHERS POPULATION

- 2.1 From your point of view or assessments that have been done, how do you compare the fish catches from the Lake between now and 5 - 10 years ago?
- 2.2 If, at all, the fish catches have declined over the years, what could be the possible reasons for that?
- 2.3 From the survey conducted, the Lozis, Bembas, and Luvaes are the major ethnic groups doing fishing in the Lake. Has everyone got the right to fish in the Lake regardless of where they come from?
- 2.4 How has been the influx of fishers into the fishing camps and fishing villages over the past 5 - 10 years? Have there been any controls against this influx? If YES, how effective has this been? If NO, why not?
- 2.5 How effective has the fishing ban been over the past 5 - 10 years? What have been the challenges?

3.0 FISHERS HOUSEHOLDS AND THEIR LIVELIHOOD

- 3.1 If there has been a decline in fish catches by the fishers, has this affected their incomes in any way?

3.2 Are the fishers involved in any alternative sources of income? If any, what are they?

3.3 As a stakeholder, have you made them aware of the need to diversify from fishing only to other sources of income? If any, how has been their response or attitude to that?

3.4 If they have been willing to diversify, are there some inhibiting factors to taking up those alternative sources of income? If so, what are they?

3.5 Are there things that need to be put in place before the fishers can easily take up the proposed alternative sources of income? If so, what are they?

3.6 Is it possible for financial institutions to come in and help the fishers with loans for them to create other sources of income?

4.0 CURRENT GOVERNANCE SYSTEM OF THE FISHERY AND COMMUNITY PARTICIPATION

4.1 How has been the governance structure for the management and conservation of the fisheries resources in this fishery?

4.2 What have been the successes and limitations in the current type of governance structure, that is, a government-controlled type of governance system?

4.3 Are the fishers aware that they are supposed to participate in the management and conservation of fisheries resources? If any, to what extent have they been able to participate in fisheries conservation?

4.4 Has the Fishermen and Fish Traders Association (FFTA) been in support of fisheries resources management and conservation efforts you have been making? If any, how has it been in support? If not, why?

4.5 Have you been satisfied with the level of organisation of this Association and their activities towards fisheries resources conservation and improving the livelihood of the fishers? What is your comment?

4.6 What has been the input of traditional leaders in fisheries resources conservation? What is your opinion?

4.7 What has been the general level of participation of the fishers in the current governance system of the fisheries resource management and conservation?

5.0 STAKEHOLDER PARTICIPATION IN FISHERIES RESOURCES CONSERVATION

- 5.1 Do you know of some other stakeholders that are involved in fisheries management and conservation around the Lake? If any, what has been their contribution to fisheries resource management and conservation efforts over the last 5 - 10 years?
- 5.2 How has been your collaboration with the other stakeholders (stakeholders mentioned here) in fisheries resource management and conservation and livelihood improvement of the fishers? In what ways have you collaborated?
- 5.3 Any challenges in the collaboration process with these other stakeholders?
- 5.4 Have you been involved in the governance process of the fisheries through the Association in the fishing community? If so, what has been your input and how satisfied have you been with the outcomes as a result of your input, in terms of successes and failures?
- 5.5 What sort of challenges have you been facing in your involvement with the fishing community or Association in as far as fisheries resource management and conservation are concerned?

6.0 POSSIBILITY OF INITIATING A COMMUNITY-BASED GOVERNANCE IN FISHERIES RESOURCES CONSERVATION

- 6.1 Would you support a co-management governance system as opposed to a central government-controlled governance system in fisheries resource management and conservation? What are your comments? Is there legislation that supports community participation in fisheries resources management and conservation?
- 6.2 If a co-management of fisheries resources and fishers' livelihood improvement was to be adopted, what role do you think your organisation can play in order for the system to work for the good of the fisheries resources and the livelihood of the fishers?
- 6.3 What role do you think the fishers should play in order for them to feel part and parcel of the whole process and contribute maximally for its success?
- 6.4 In your own opinion, what role should the Association play in the implementation of this type of governance system?
- 6.5 What role would other stakeholders (each stakeholder is mentioned here) play in the implementation of a co-management governance system?

- 6.6 Incentives make players in the running of any organisation motivated to put in their best. What sort of incentives do you think would make the players, especially the fishers, in the co-management for them to put in their best towards effective fisheries resource management and conservation?
- 6.7 What could be the possible positive and negative impacts of a co-management on fisheries resources and livelihoods of the fishers, if promoted?
- 6.8 What do think could be the possible limitations or challenges in the implementation of the fisheries co-management? How can these limitations be overcome?
- 6.9 What are your recommendations on the feasibility of implementing a co-management governance system on Lake Itzhi-Tezhi fishery?

**THANK YOU VERY MUCH FOR YOUR PARTICIPATION IN THE
INTERVIEW**

Appendix D: Interview schedule for other stakeholders

(Local government, District Commissioner's office, Agriculture Department, Livestock Department, and private firms)

1.0 INTRODUCTION

- 1.5 How long have you been working for the Institution or Department?
- 1.6 What are your responsibilities in the Institution or Department?
- 1.7 As an Institution or Department, have you ever worked with the fishers around Lake Itzhi-Tezhi?
- 1.8 For how long did you work or have you been working with this fishing community?
- 1.9 What sort of work did you do or have been doing with the fishing community?

2.0 STAKEHOLDER PARTICIPATION IN FISHERIES RESOURCES CONSERVATION AND FISHERS' LIVELIHOODS

- 2.1 What has been your contribution, if any, to fisheries resource management and conservation and/or improvement of livelihoods of fishers' households?
- 2.2 How has been your collaboration with the other stakeholders (each stakeholder is mentioned here) in fisheries resource management and conservation and/or improvement of livelihoods of fishers' households? In what ways have you collaborated?
- 2.3 Any challenges in the collaboration process with these other stakeholders?
- 2.4 Have you been involved in the governance process of the fisheries through the **Fishermen and Fish Traders Association** in the fishing community? If yes, what has been your input and how satisfied have you been with the outcomes as a result of your input, in terms of successes and failures?
- 2.5 What sort of challenges have you been facing in your involvement with the fishing community or Association in as far as fisheries resource management and conservation and/or improvement of livelihoods of fishers' households is concerned?

3.0 POSSIBILITY OF INITIATING A COMMUNITY-BASED GOVERNANCE IN FISHERIES RESOURCES CONSERVATION

- 3.1 If a co-management governance system in fisheries management and conservation was to be adopted, what role do you think you can play in order for the system to work for the good of the fisheries resources and the livelihoods of fishers?
- 3.2 What role do you think the fishing community should play in order for them to feel part and parcel of the whole process and contribute maximally for its success?
- 3.3 If, at all, the Department of Fisheries were to be involved in the co-management governance system, what role should it possibly play for the success of the initiative?
- 3.4 In your opinion, what would be the role of other stakeholders (each one is mentioned here) in the implementation of this governance system?
- 3.5 Incentives make players in the running of any organisation motivated to put in their best. What sort of incentives do you think would make the players, especially the fishing community, in this type of governance system for them to put in their best in fisheries resource management and conservation and/or improvement of livelihoods of fishers' households?
- 3.6 What do think could be the possible limitations or challenges in the implementation of the co-management for fisheries management and conservation and fishers livelihood? How can these limitations be overcome?
- 3.7 What are your recommendations on the feasibility of implementing a co-management governance system for fisheries resource management and/or conservation and improvement of livelihoods of fishers' households?

**THANK YOU VERY MUCH FOR YOUR PARTICIPATION IN THE
INTERVIEW**
